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THE STIGMA OF BANKRUPTCY: SPOILED ORGANIZATIONAL IMAGE AND ITS MANAGEMENT

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Interview, archival, and observational data from four computer firms were used to develop a theory about how Chapter 11 of the Federal Bankruptcy Code spoils the image of top managers and firms. We propose that Chapter 11 is a discrediting label that causes key organizational audiences to have negative reactions towards a firm, including disengagement, reduction in the quality of participation, bargaining for more favorable exchange relationships, and denigrating an organization and its leaders. Those negative reactions further increase the probability of organizational death and threaten managerial careers. We also propose a hierarchy of stigma-management strategies that leaders may use in their efforts to avert or repair the spoiled images of top management and firms.

My reputation was smirched. It was as if I had committed some sort of sin. I felt guilty. I will never be able to get [venture capital] funding again. I will never get another chance to be CEO. ˍ
—From an interview with a former chief executive officer of a bankrupt computer firm.

Top management's image can be spoiled by a variety of organizational problems, including poor financial performance, fatal industrial accidents, and defective products. Both popular writings (Kanter, 1983; Peters & Waterman, 1982) and academic perspectives (Hambrick & Mason, 1984; Pfeffer, 1981; Salancik & Meindl, 1984) emphasize that competent leaders

are expected to exercise control over their organizations and that such control is expected to lead to organizational success. Thus, when a firm is in a serious predicament, observers may wonder: if top management is in control, why is the firm in so much trouble? Even if no one explicitly raises that question, the idea is in the air and is deeply discrediting to leaders.

The images of organizations and their leaders are intertwined. Indeed, Hambrick and Mason (1984) argued that an organization is a reflection of its top managers. If the members of an organization and its external constituencies do not perceive top management as credible, their faith in the organization erodes. Such spoiled images can cause those individuals, who constitute the *organizational audience* for whom top management must perform, to withdraw their support for the organization (Salancik & Meindl, 1984). Such withdrawal deepens the predicament, for the effectiveness of any organization depends on the continued participation and support of its organizational audiences (Cameron & Whetten, 1983).

Discrediting predicaments like poor financial performance or deadly industrial accidents also create difficulties for leaders as individuals. In Goffman's (1967) terms, such signs of poor leadership make it difficult for top managers to maintain "face," or to present an image that enables them to claim the status associated with their role. Discredited leaders may feel embarrassed. They may be fired. And their careers may sustain long-term damage.

The present research considers one such discrediting predicament. We used case studies of four computer firms to develop a grounded theory about the stigma that results when a company files for protection under Chapter 11 of the Federal Bankruptcy Code. The bankrupt firms we studied were often shunned by members of their organizational audiences. The leaders we interviewed were hurt and embarrassed. Even though we were careful not to mention the word "stigma" during interviews, informants used it often in describing their predicament.[1]

Indeed, our research revealed that the spoiled images resulting from the Chapter 11 label are analogous to those described by Goffman (1963) in his classic book *Stigma: Notes on the Management of Spoiled Identity* and in more recent writings by Page (1984) and by Jones, Farina, Hastorf, Markus, Miller, and Scott (1984). These writings indicate that a stigma refers to an attribute that is deeply discrediting. A stigma reduces "a whole and usual person to a tainted, discounted one" (Goffman, 1963: 3).

Evidence from the four cases we investigated indicated that both internal organizational audiences like lower-level employees and members of

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[1] This study focused on firms that have filed for Chapter 11 because they are financially insolvent and are seeking protection from their creditors. Our theory is not intended to extend to firms that have filed for Chapter 11 for other reasons. Thus, the present analysis might not apply to Continental Airlines, which may have filed for Chapter 11 in an effort to break a union. Nor does it extend to the Manville Corporation, a profitable firm that is alleged to have filed in anticipation of costly personal injury lawsuits. Such organizational predicaments may also discredit management, but we prefer not to stretch our analysis to those atypical cases.

middle management and external audiences like customers, creditors, and suppliers viewed leaders of bankrupt firms as tainted and incompetent people; such unfavorable images even extended to leaders who joined a firm after Chapter 11 had been filed. In the framework presented here, we propose that the spoiled image of top management and the associated spoiled image of a firm lead key organizational audiences to change both enacted relationships with a firm and espoused evaluations of the firm and its leaders. We hypothesize that those negative reactions, or "sent stigmas," further reduce the viability of bankrupt firms. We also propose that such sent stigmas damage the careers of top managers and cause them to feel the embarrassment, anger, and loss of self-esteem experienced by stigmatized people.

The literature on stigma also guided theory building about the techniques used to manage the spoiled images of bankrupt firms and their leaders. Writings on stigma management (Goffman, 1963; Jones et al., 1984) and related literature on the impression management strategies used by individuals in identity-threatening predicaments (Schenkler, 1980) provided useful points of departure for understanding and sorting the strategies used by leaders in their efforts to avert or reduce damage to individual and organizational images. We propose a hierarchy of five strategies for managing stigma that is based on the extent to which top managers acknowledge the stigma of bankruptcy when addressing a given organizational audience. The five strategies are concealing, defining, denying responsibility, accepting responsibility, and withdrawing.

The remainder of this paper describes the four case studies and elaborates a conceptual perspective grounded in those data. Following the logic of induction, we present the method first and the theory second.

METHODS

Organizations and Informants

Each organization selected for this research met three criteria: (1) it had filed for reorganization under Chapter 11 of the Federal Bankruptcy Code, (2) it was still operating, and (3) it was in the computer industry. Table 1 gives pseudonyms and some descriptive statistics for the core group of four Silicon Valley computer firms: Visionary Computers, Enoch Computers, Perfect Peripherals, and Mega Peripherals. In addition to those firms, we attempted to interview the leaders of two other bankrupt firms, but they refused to participate in our study. As we explain later, however, some data were gathered during these initial phone conversations with potential informants.

Each firm in the core group sought protection under Chapter 11 of the Federal Bankruptcy Code because it lacked the assets to pay major creditors. Under Chapter 11, creditors' claims against a firm are stayed pending a bankruptcy court's approval of plans for restructuring all debts. Restructuring debts means (1) determining the order in which creditors will be paid according to legal rules of priority—for example, whether the creditors made

TABLE 1
Core Cases of Bankrupt Firms

Firms[a]	Numbers of Employees[b]	Ages of Organizations in Years	Numbers of Informants Interviewed	Unsecured Debts at Time of Filing Chapter 11[c]
Visionary	175	6.25	7	$1,266,000
Computers	30			116,000
Enoch	200?	12.00	5	1,175,000
Computers	25			80,000
Perfect	225	3.50	4	6,894,000
Peripherals	50			939,000
Mega	525	3.50	6	11,500,000
Peripherals	95			2,700,000

[a] Pseudonyms are used to protect the confidentiality of these firms and their members.

[b] The first number is the number of employees when the company was at its largest. The second is the number of employees the day the company filed for Chapter 11. A question mark appears for Enoch Computers because the first number is based on an informant's estimate.

[c] The first figure represents the total unsecured debt rounded to the nearest $1,000; the second represents the largest individual unsecured debt. Data are from court records.

secured or unsecured loans; (2) how much creditors will be paid—typically, less than 100 cents on the dollar; and (3) the time over which payments will be stretched out. A bankrupt firm's major creditors usually form a committee that hires and pays a bankruptcy lawyer. The debts of each of the four firms studied had been or were being restructured through negotiations between the firm's top management and a creditors' committee.[2]

The number of informants interviewed for each case (see Table 1) was determined by Glaser and Strauss's (1967) concept of "theoretical saturation"—we stopped interviewing additional informants when we began hearing the same stories repeated again and again. More specifically, for each organization, we tried to interview the president at the time of the Chapter 11 filing, at least one other member of top management, a major creditor, and a lawyer who was involved. We also interviewed other people who were nominated by informants as key actors.

We were able to interview the president who was in place at the time of the Chapter 11 filing in each firm except Enoch Computers. In the case of Enoch, however, we were able to observe the president during a meeting of the creditors' committee at which he did much of the talking. We were able to interview at least one other member of top management, a major creditor, and a lawyer for all but one bankruptcy—Visionary Computers' two major creditors declined to be interviewed.

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[2] For further information about Chapter 11, see Nelson (1981), Herzog and King (1983), and Platt (1985).

Data Sources

This research relied primarily on four data sources: (1) initial observa-
tions, (2) semistructured interviews, (3) records data, and (4) observation of
a creditors' committee meeting.

Initial observations. A form was used to summarize the telephone con-
versations in which we introduced the research and ourselves to potential
informants and their gatekeepers. It was a modified version of an instrument
used by Sutton (1984) to record the reactions of informants in a study of
organizational death. We viewed initial conversations as "field stimulations"
(Salancik, 1979: 638) that tickled, tempted, and perturbed prospective infor-
mants and their gatekeepers.

The instrument included open- and closed-ended items. Although this
source yielded both quantitative and qualitative evidence, our theory-building
effort relied primarily on the qualitative evidence. The items concerned
behavioral reactions, such as shielding by gatekeepers, and emotional
reactions, including anger, denial, avoidance, sadness, and joking. The form
also had space for recording miscellaneous data that emerged during the
initial conversations.

Potential informants we spoke to who would not, or could not, partici-
pate in a face-to-face interview were asked if they "would mind answering a
brief question about the bankruptcy." The question was, "What is the most
important bit of advice that you would give to someone who faced the
prospect of managing a company that had filed for reorganization under
Chapter 11?" A 45-minute answer provided by the president of one bankrupt
computer company to which we failed to gain entry was especially enlight-
ening. When we were unable to reach a potential informant, initial observa-
tions were still made about the behavior of the gatekeeper or gatekeepers we
encountered.

The telephone instrument was completed for the 34 individuals we
chose as informants. Three informants associated with the two organizations
in which failure at entry occurred and nine individuals involved in the core
cases did not participate further. Twenty-two informants granted face-to-
face interviews. Thus, the response rate for complete participation was 65
percent.

Semistructured interview. An interview was developed for the present
study; its content was based on a rough working framework developed prior
to data collection and on pilot studies[3] of three bankrupt firms. It consisted

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[3] The three pilot studies were conducted by student groups in the senior author's course on
Managing Organizational Transitions. Approximately 12 interviews were conducted with the
top managers of three computer firms that had filed for Chapter 11. These pilot studies ad-
dressed three primary questions: (1) is a stigma cast by Chapter 11 of the Federal Bankruptcy
Code? (2) if there is a stigma, how is it managed? and (3) is it possible to gain interviews with
leaders of bankrupt firms? The success of these pilot studies encouraged us to conduct the
present research. The pilot studies influenced the content of semistructured interviews directly
because students told us about which questions had worked well and which had not. The pilot
studies also influenced the content of the interview indirectly because these preliminary data
helped us refine our rough working framework.

of 72 open-ended questions. In addition, since this was an inductive study, we pursued unexpected but interesting lines of discussion. Twenty of the 22 interviews were tape recorded and then transcribed. The typical interview was 90 minutes; the length varied from 30 minutes to three hours.

The interview began with questions about the history and structure of an organization. We then asked about the onset of financial difficulties and the filing of bankruptcy. Next, informants were given a list of key individuals and groups that may have participated in the bankruptcy. These were customers, consumers, suppliers, top management, middle management, lower level employees, founders, venture capitalists, stockholders, employees' families, lawyers, banks, community, journalists, user groups, associates in other computer firms, and creditors. We asked informants to list key participants who had been left out and to cross out individuals and groups that were not involved in the bankruptcy. We then asked them to tell us: (1) how each individual or group responded to the bankruptcy, (2) how leaders of the bankrupt company were managing relations with that individual or group, and (3) the informant's own role in the relationship.

The interview concluded with questions about the anticipated fate of a firm and ways in which the bankruptcy had been managed well and managed badly. The final question was a request for the names of other people involved, both people who agreed and those who disagreed with the informant's perspective.[4]

Records data. We obtained copies of court records for each case. Companies that file for Chapter 11 in the United States Bankruptcy Court must submit lists of all creditors, and lawsuits pending against the company must be identified. Reorganization plans must also be filed with the court and approved by a judge. We gathered other records data, including newspaper and magazine articles and correspondence between the company and creditors. The correspondence did not provide any new information, but it was useful for confirming data obtained from other sources. At least one article had been written about each bankruptcy, including feature-length articles about Visionary Computers and Mega Peripherals.

Observation of a creditors' committee meeting. We were invited to observe a creditors' committee meeting, which lasted for three hours. We observed about 90 minutes of heated negotiation between the creditors and management of Enoch Computers. We also were allowed to observe discussions between the creditors and their lawyer that occurred before and after the confrontation with Enoch's management. This observation was an essential part of the data collection because both the audiences' negative reactions and the managers' emotional responses were highly explicit.

Qualitative Analysis

The method of qualitative analysis used here draws on descriptions of how to generate grounded theory written by Glaser and Strauss (1967),

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[4] Copies of the initial observation form and the structured interview can be obtained by writing the first author.

Mintzberg (1979), and Miles and Huberman (1984). The method entailed constantly comparing data and theory until we developed adequate conceptual categories.

An important assumption underlying the method is that data do not develop theory; human creativity and intuition are required (Mintzberg, 1979). Yet the method requires theory builders to compare their ideas to empirical evidence. As an investigator travels back and fourth between theory and data, some initial ideas can be grounded in the evidence, others may be modified considerably on the basis of evidence, and still others may be abandoned for lack of evidence.

Some variation of this method was used at all stages in the research. Before, during, and after data collection, we had frequent meetings to discuss the emerging theory. Early meetings focused on developing a rough working framework. The framework was based on the pilot studies of three bankrupt organizations and on a review of pertinent literature. Meetings during the data collection phase entailed adjusting the framework to allow for new facts and ideas and planning to collect new evidence. Several of those meetings were enriched by a third researcher, who served as devil's advocate. His primary assignment was to discover and describe flaws in data collection methods and in the rough working framework.

Qualitative analysis after the data had been gathered entailed systematic comparison of data and theory. The emerging theory reflected Van Maanen's observation that "qualitative work is more concerned with commonality and things shared in the social world than it is with differentiation and things not so shared" (1983: 257). Our analysis of the data thus focused on identifying theoretical elements that remained constant across the four cases. Some concepts suggested by the literature on stigma and by our initial intuitions were ultimately deleted from the framework because they could not be grounded in evidence. Other elements were not included because, even though they appeared across the cases, there were too many other examples that were inconsistent with the proposed element. Still other initial ideas had to be modified considerably. A few of the theoretical elements we proposed initially could be grounded firmly in the evidence and required no modification.

Our methods of comparing and reporting the evidence across the four cases built on Miles and Huberman's (1984) suggestions for cross-site analysis with qualitative data and on the methods used by Harris and Sutton (1986) for identifying constant elements across cases. We completed cross-site display tables about audience responses (see Table 2) and stigma-management strategies (see Table 3). Constructing the tables entailed reviewing the four sources of evidence for each case. The tables indicate how strongly each proposed theoretical element can be grounded in evidence from the initial observation form, semistructured interview, records data, and observation of the creditors' committee meeting. The model of how the stigma of Chapter 11 affects organizations and leaders (Figure 1) was also developed through continuous comparison of data from the four cases and the emerging theory.

Finally, it is important to make explicit our assumptions about the strength of the match between the proposed theoretical elements and the evidence. The conceptual perspective advanced here emphasizes ways in which bankrupt organizations are similar rather than different. Yet some of the proposed constant elements were not observed in every case. In quantitative research, one does not expect a set of independent variables, for example, to explain 100 percent of the variation in a set of dependent variables (Mintzberg, 1979). Similarly, the conceptual perspective proposed here fits well with the qualitative evidence—but it does not fit perfectly.

THE SET OF SPOILED RELATIONSHIPS
BETWEEN BANKRUPT FIRMS AND ORGANIZATIONAL AUDIENCES

Our central argument is that filing for Chapter 11 can spoil the image of top management and, by extension, the image of a firm as a whole. Representatives of key organizational audiences who perceive that top management is not credible will withdraw support from a firm (Salancik & Meindl, 1984). Thus, the survival of the troubled companies we studied depended heavily on the ability of top management to maintain—both in terms of quality and quantity—the participation and support of key members of the organizational audiences for whom they performed. In each bankruptcy studied, key relationships existed between top management and each of the following organizational audiences: (1) customers, (2) lawyers, (3) journalists, (4) stockholders, (5) venture capitalists, (6) middle managers, (7) lower level employees, (8) competitors, (9) creditors, (10) suppliers, (11) government officials, (12) peers in other computer firms, and (13) members of employees' families. Other participants, such as "head hunters" and bankers, were key actors in some, but not all, of the firms.

Chapter 11 does not automatically spoil the image of a firm or its leaders. The stigma literature distinguishes between "markable" and "marked" relationships. Markable relationships are those that have the potential to be spoiled by a discrediting label; marked relationships are those that have been spoiled (Jones et al., 1984: 6–9).

Relationships between a firm and each audience are not automatically marked by the fact of Chapter 11 because, like many other stigmas (Page, 1984; Jones et al., 1984), bankruptcy can sometimes be concealed from some audiences—at least for a time. The top managements of all four firms hid the planned legal action as long as possible. Moreover, firms that have filed for Chapter 11 are required to notify all creditors, but not other people like customers or new suppliers.

Further, from the perspective of some organizational audiences, Chapter 11 may not spoil the image of a firm or its leaders. For example, some bankruptcy lawyers argued that they did not believe that there was, or should be, a stigma associated with Chapter 11.

Nevertheless, the stigma literature suggests that when a potentially discrediting predicament arises, people who are viewed as blameworthy will be most likely to suffer from spoiled identity (Goffman, 1963; Page, 1984). There

is universal agreement that top management will receive most of the blame for poor organizational performance (Argenti, 1976; Peters & Waterman, 1982; Pfeffer, 1977; Pfeffer & Salancik, 1978; Salancik & Meindl, 1984). Moreover, research by Meindl, Ehrlich, and Dukerich (1985) suggests that observers will attribute the strongest responsibility to leaders when organizational performance is very good or very poor. Bankruptcy is an unambiguous case of very poor organizational performance.

Our analysis of the qualitative data is congruent with the view that bankruptcy poses a profound threat to the credibility of top management. Not every relationship between individual top managers and individual audience members was spoiled. But in each firm studied, at least one representative of each key organizational audience perceived that the image of the firm and its top management was spoiled. The next section details the negative reactions of audience members to such spoiled images and the hypothesized effects of those negative reactions on firms and their leaders.

A MODEL OF HOW THE STIGMA PROCESS UNFOLDS IN BANKRUPT FIRMS

Goffman (1963) and Jones and his colleagues (1984) proposed that encountering a stigmatized person will lead "markers" (exchange partners and other observers) to have negative reactions like withdrawal, irrational beliefs about the peril posed by the stigma, and negative attitudes. Those negative reactions are "sent stigmas"; the perception of such negative reactions by a marked person leads to emotional reactions (e.g., guilt, anger, embarrassment) that are "felt stigmas" (Page, 1984). A sent stigma can also cause difficulties for a marked person that go beyond internal feelings, such as trouble finding a job.

This conceptual perspective served as our point of departure in developing an empirically grounded model of how the stigma process unfolds in bankrupt firms. Figure 1 indicates that the discovery of Chapter 11 leads some organizational audiences to perceive that a firm and its top management are discredited. Such spoiled images cause key audiences to change enacted relationships and espoused evaluations associated with a firm and its top managers. We propose that these negative reactions have undesirable effects on an organization as a whole, with increased probability of organizational death the principal negative outcome, and on the members of top management specifically. Felt stigma, accelerated chance of managerial succession, and harm to individual careers are salient negative effects on managers.

The Range of Audiences' Negative Reactions

Table 2 is a summary of our efforts to ground a set of five negative reactions in data from the interviews, initial phone conversations, records, and observations of the creditors' committee meeting. The table also provides an example of each negative reaction.

TABLE 2
Organizational Audiences' Negative Reactions to Chapter 11

Audience Responses	Visionary Computers[b]	Perfect Peripherals	Enoch Computers	Mega Peripherals	Examples
(a) Changes in Enacted Relationships[a]					
Disengagement	I, p	I, p	I, O	I	The attitude of the members of the creditors' committee when they first get started is "Those SOB's burned me for a bunch of money, I'll never do anything for them now!" (Creditor)
Reduction in the quality of participation	I	i		I	It's been a problem getting good disks all along because we have a very tight criterion .... It's gotten worse in the last month .... They're trying to dump some material on us. (Manager of product testing)
Bargaining for more favorable exchange relationships	I, C	I, C	I, O, C	I	Finally we agreed to continue supplying them based on cash in advance on all material and the rest on a COD basis. (Creditor)
(b) Changes in Espoused Evaluations					
Denigration via rumor	I	i	O	I	You know that when they [competitors] can they're gonna try to go after your customers. And if they're really unscrupulous, they will say, "Ah, but they're in bankruptcy." (President)
Denigration via confrontation	I, C	A, p	O, C	i	Oh, there was one letter he wrote to the board of directors: "We believe that certain officers of the company are methodically carrying the company towards bankruptcy for their own personal enrichment." (President)

[a] Observation of creditors' committee meeting was available only for Enoch Computers. We defined strong evidence as multiple and unambiguous examples from a single source or single and unambiguous examples from multiple sources, and modest evidence as a single and unambiguous example from a single source.

TABLE 2 (continued)

bLegend: I = strong evidence from interviews.
        i = modest evidence from interviews.
       A = strong evidence from articles.
       a = modest evidence from articles.
       C = strong evidence from court records.
       c = modest evidence from court records.
       O = strong evidence from observation of creditors' committee meeting.
       o = modest evidence from observation of creditors' committee meeting.
       P = strong evidence from initial phone contact.
       p = modest evidence from initial phone contact.

The first three reactions are changes in the enacted relationship between an organizational audience and a firm: (1) disengagement, (2) reduction in the quality of participation, and (3) bargaining for more favorable exchange relationships. The remaining two reactions are changes in the espoused evaluation of the firm and leaders: (4) denigration via rumor and (5) denigration via confrontation.

Disengagement. The stigma literature indicates that people who are engaged in a long-standing relationship with a recently stigmatized person may react with overt or subtle rejection (Jones et al., 1984). Similarly, relationship disengagement after the Chapter 11 label had been discovered was among the most frequent negative reactions observed across the four cases.

Some suppliers refused to send parts, even though they would have received cash on delivery. In all four firms, customers stopped buying products because they did not want an "orphan" computer or computer peripheral.[5] Some customers even disengaged in ways that caused the bankrupt firms to lose money on goods that had already been sold. For example, a newspaper article on Visionary Computers reported the following customer reactions to the bankruptcy:

> As word of the troubles spreads, customers may refuse to pay
> bills or even ship back, marked "defective," perfectly function-
> ing equipment.

There was much variation in the means by which disengagement occurred. The last example suggests that some customers simply began treating the firms as if they did not exist. Our interviews suggested that suppliers usually severed relationships through formal communication. Other forms of relationship disengagement appeared to be more personal. The president of one company joked that "my neighbors treat me as if I have AIDS." He explained that neighbors had been avoiding him since news had spread that his firm had filed for Chapter 11.

Reduction in the quality of participation. This second negative reaction was observed in all cases except Enoch Computers. Some audiences are unable or unwilling to disengage from their relationship with a bankrupt firm. Landlords and suppliers may have binding contracts, and old friends may feel guilty about deserting the troubled firm.

Reducing the quality of participation is an implicit way to withdraw partially from a marked relationship. Individuals or groups that use this tactic often think that a bankrupt firm should not be treated as well as a healthy organization. Moreover, some audiences may reduce the quality of their participation because they can get away with it. Stigmas tend to reduce the power of those who are marked (Jones et al., 1984). Similarly, leaders of the troubled firms we studied often did not have the funds, personnel, or legitimacy required to entice or force participants to maintain high quality participation. To illustrate, informants from three of the four firms reported that suppliers began sending "junk" to the firm after Chapter 11 had been

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[5] An orphaned computer product is one that is no longer manufactured or supported by any company.

announced. A manager at Mega Peripherals, for example, complained that the quality of disks sent by one supplier had deteriorated since they had filed for bankruptcy:

> When 30 percent of the disks that come in are obviously defective,
> you know that you are in trouble. That's our big killer right now.
> Right now we're spending a lot of time using disks as frisbees
> basically because they're not any good. Almost all the vendors
> are trying to [use the bankrupt firm to] clean out their stock.

Bargaining for a more favorable exchange relationship. This third negative reaction occurs because individuals or organizations that participate in relationships with bankrupt firms can often negotiate more favorable terms of exchange than previously existed; the fact of Chapter 11 increases their bargaining power. Creditors who have not received promised payments often do not trust the leaders of bankrupt firms, nor do customers who are concerned about continued support for their purchases. Thus, audience members who maintain relationships with a bankrupt firm can argue for a better deal because they face some objective peril.

But more subtle forces may also affect such bargaining. We noted that the Chapter 11 label encourages some audiences to disengage from relationships with a firm. Since the pool of exchange partners shrinks, a bankrupt firm is more dependent—and thus less powerful—in its relationships with remaining exchange partners (Pfeffer & Salancik, 1978). Furthermore, just as those associated with a marked person suffer a "courtesy stigma" (Page, 1984: 9), employees, customers, lawyers, suppliers, and venture capitalists who engage in such relationships may suffer reduced status because they are linked to a firm that has a spoiled image.

We encountered much evidence that suppliers were able to negotiate for higher prices and for cash on delivery. Customers were able to negotiate for lower prices. New executives hired by bankrupt firms were able to negotiate for higher salaries. The president of Visionary Computers argued that high pay was essential to his career because he could give future employers a good reason for accepting a job in a bankrupt firm.

Denigration via rumor. We also encountered persistent evidence that key organizational audiences cast aspersions on firms after bankruptcy had been announced. As is often the case with a stigmatizing label (Jones et al., 1984), much of this denigration exaggerated the peril associated with participating in a firm that has filed for Chapter 11. Denigration via rumor was the most common change in the espoused evaluation of firms (see Table 2). Former managers, current employees, journalists, suppliers, interested observers in other computer firms, and competitors would spread nasty rumors about a troubled firm. Although we encountered occasional evidence of complimentary rumors, most rumors reflected badly on the bankrupt firms and their leaders. To illustrate:

> I think Montgomery [the current president] deserves most of the
> credit for Perfect Peripheral's demise. More than anyone else, he
> is responsible. . . . [He] did everything possible to snatch defeat

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> from the jaws of victory. (Former president, Perfect Peripherals,
> in a letter to a newspaper concerning a previously published
> article.)

The function of rumor is to "restructure ambiguous situations by explaining what has happened, by reporting what is happening, and by predicting what will happen" (Smelser, 1962: 82). Chapter 11 creates much ambiguity—organizational audiences typically have little knowledge about the legal meaning of the term, management is often secretive, and events may happen so quickly that current information is inadequate. Thus, perhaps it was inevitable that rumors were a persistent theme in the four bankruptcies.

Leaders of bankrupt firms were the most visible employees of such firms and, as mentioned earlier, were viewed by audiences as most blameworthy. Thus, the bulk of the rumors focused on their incompetence and likely departure. One chief executive described a phone call from a journalist:

> He was absolutely irresponsible in putting in gossip bits. He
> called me up one day and said, "I understand there's somebody
> waiting to invest 10 million in Mega Peripherals if you'll leave."

Other rumors reflected badly on a firm as a whole. At least two of the companies faced persistent and false rumors that a closing was to occur any day. In one case, representatives of a competitor urged customers to stop buying products from a bankrupt firm because it was "dead."

Denigration via confrontation. Direct insults were encountered less frequently than rumors, but Table 2 reveals that they did occur in all four cases. Such denigration may be especially damaging to its targets because it is so embarrassing. Insults make it difficult for any person to maintain face, or to claim the status associated with a role (Goffman, 1967).

The company presidents we studied appeared to be the most frequent targets of denigration via confrontation. There were, for example, many nasty insults during the creditors' committee meeting. One creditor (a big fellow, with a red and angry face) told the president to "quit making excuses for your incompetence." We encountered a case of a former president casting aspersions on the entire top management team. Court records revealed that he wrote a series of letters in which he accused the company of poor management and stated that a closing was inevitable. The former president tried, unsuccessfully, to purchase the assets of the company. The new president believed that such denigration was intended to reduce the value of the firm, thus dropping the price the former president would have to pay.

Effects of Negative Reactions on Organizations and Top Managements

Survival is unlikely for most firms that have filed for Chapter 11 because of their objective financial condition (Nelson, 1981; Platt, 1985). We propose, however, that stigma further damages the viability of a bankrupt firm. As Figure 1 shows, we propose that negative audience reactions increase a bankrupt firm's already high probability of organizational death. Chances of demise increase because the loss of valuable relationships, lower quality participation, and less favorable exchange relationships directly reduce the

FIGURE 1
A Model of How the Stigma of Chapter 11 Affects Organizations and Top Managements

Chapter 11 discovered by one or more members of the organizational audience

↓

Top management and the firm as a whole are perceived as discredited; their image is spoiled

↓

Range of Audience Members' Negative Reactions

Changes in Enacted Relationships

- Relationship disengagement
- Reduction in the quality of participation
- Bargaining for a more favorable exchange relationship

Changes in Espoused Evaluations

- Denigration via rumor
- Denigration via confrontation

Effects on the Organization as a Whole

Increased probability of organizational death

Specific Effects on Top Management

- Felt stigma
- Accelerated chance of managerial succession
- Harm to individual careers

quality and the quantity of inputs to organizational systems. Further, denigration via rumor and via confrontation further encourage organizational actors to withdraw from a firm and discourage new actors from participating in relationships with it.

Moreover, independent of any denigration, the stigma of Chapter 11 makes it difficult to establish new relationships that can help save a firm. The presidents of Perfect Peripherals and Mega Peripherals tried to save those firms through acquisition by a larger corporation. Both presidents reported that, although they were willing to settle for very low prices, the stain caused by the words "Chapter 11" severely hampered such efforts.

In Katz and Kahn's (1978) terminology, organizational systems begin to run down because they cannot import sufficient energy from the world around them; such systems are characterized by positive entropy. Imperfect laws and judges certainly hamper firms that file for Chapter 11 (Nelson, 1981), and some of our informants blamed greedy lawyers for the demise of such firms. But the model advanced here may help explain why—in addition to financial troubles experienced before filing for Chapter 11—so few firms survive bankruptcy proceedings.

Figure 1 also indicates that the five negative reactions and the associated increased probability of organizational death are proposed to have ill effects on top management. First, managers feel a strong stigma. Like members of other stigmatized groups, they suffer from loss of self-esteem, guilt, anxiety, and anger (Goffman, 1963; Jones et al., 1984). Figure 1, combined with Goffman's (1959, 1967) writings on "face-work," help us understand the spoiled image felt by the leaders of the four companies. Goffman contends that a person can claim the status associated with a role by presenting a self that is consistent with the "face" that observers believe is acceptable for the role. Goffman asserts that embarrassment occurs when aspects of the presented self are discrepant from the claimed self.

One of top management's primary functions is to maintain exchange relationships between an organization and key individuals and groups (Pfeffer & Salancik, 1978; Salancik & Meindl, 1984). Moreover, leaders are expected to keep others from denigrating their companies. Top managers are also expected to be able to keep their companies alive. The stigma of bankruptcy increases the chances that leaders will fail at those tasks. Thus, members of organizational audiences interpret firms' problems as personal attributes of their leaders (Meindl et al., 1985; Pfeffer, 1977). As a result, suppliers, employees, customers, and others may expect leaders of bankrupt firms to feel shame and guilt. Moreover, since managers are socialized to believe that they should be able to control the fate of an organization, they may view their firm's financial troubles as a personal failure regardless of the expectations of audience members.

Nonetheless, we were surprised by how frequently—and how intensely— leaders of bankrupt firms acknowledged felt stigma. Consider the following quotes from presidents of the bankrupt firms studied:

> I feel as if I committed some kind of sin.

> I think that it is the equivalent of having accidently killed your spouse and then having to live with it the rest of your life.

Felt stigma was also evident from observing top managers. Our field notes from the creditors' committee meeting describe the president of Enoch Computers:

> Tom was extremely nervous. He cleared his throat over and over again. He chain-smoked. He was hunched over. His hands and voice trembled. And he made an odd sort of hissing noise over and over. He looked psychologically beaten. I felt like a voyeur, spying on Willy Loman.

Moreover, at least two of the managers we interviewed reported feeling stigmatized in part because their families felt a courtesy stigma. A courtesy stigma is guilt by association suffered by the colleagues, friends, and family of a tainted individual (Page, 1984). The president of one company reported that his wife felt shunned by friends because of the bankruptcy. Similarly, the president of another bankrupt firm had been a manager at IBM for many years and lived in a neighborhood populated primarily by his former co-workers who still had secure, and unstigmatized, positions at "Big Blue." He was upset because his children were being teased by other children in the neighborhood about the bankruptcy.

Second, we propose that the negative effects listed in Figure 1 increase the probability of managerial succession because powerful organizational audiences view the changes in enacted relationships and espoused evaluations presented in Table 2 as evidence that top managers have lost control of a firm. The proposal is consistent with evidence that leaders of poorly performing organizations are more likely to be replaced than leaders of healthy organizations (Gamson & Scotch, 1964; McEachern, 1975; Pfeffer & Salancik, 1978).

There was much managerial succession in firms we studied; the top-ranking financial officer had left shortly before or after the Chapter 11 filing in all four firms, and three of the four presidents had been replaced shortly before or after the filing. The hypothesis is also consistent with Schwartz and Menon's (1985) statistical study of executive succession in 140 bankrupt firms. They found that leaders of bankrupt firms were replaced significantly more often than leaders of comparison firms that were not bankrupt.

Succession in bankrupt firms is often involuntary. But the embarrassment of being associated with a bankrupt firm may also encourage leaders to voluntarily seek employment with successful organizations. A controller who had acquired his job after the Chapter 11 filing told us that family and friends kept asking him: "Why do you want to be part of it?" He also reported that people viewed him as a "loser."

Finally, Figure 1 proposes that members of top management face harm to their individual careers. We offer that hypothesis because association with failure is contrary to expectations held for managers. Managers will have difficulty finding new jobs, or jobs with equal prestige and pay, if they have

demonstrated that they are unable to stop a firm from going bankrupt, unable to maintain the organizational participation of key groups and individuals, and unable to stop others from denigrating the firm.

Our review of the literature indicated no published research on that topic. But informants we interviewed told us about the subsequent career progress of former members of top management for all firms except Enoch Computers. There was a consistent pattern: former members of top management were having trouble finding new jobs and were often forced to accept new jobs with lower status and pay. As the quotation that introduces this paper indicates, one ex-president told us that his association with a bankrupt firm meant that he could never be a CEO again and could never get venture capital.

STIGMA-MANAGEMENT STRATEGIES

Once an organization files for Chapter 11, it is incumbent on top management to avert or repair spoiled relationships with key organizational audiences. We used the stigma literature (Berk, 1977; Goffman, 1963; Jones et al., 1984) and related writings about impression management techniques used by individuals in identity-threatening predicaments (Schenkler, 1980; Tedeschi, 1981) as points of departure for developing theory about the stigma-management strategies used by the leaders of bankrupt firms. Evidence from the bankrupt firms enabled us to propose five stigma-management strategies that leaders may use: concealing, defining, denying responsibility, accepting responsibility, and withdrawing. Table 3 presents examples and information regarding the prevalence of each strategy across the four cases.

Departing from the practice of much social science research (Trice, 1985), we considered both the functional and the dysfunctional aspects of the strategies. We drew on evidence from the qualitative study to illustrate key hazards and opportunities associated with each strategy but made no predictions about the relative effectiveness of those strategies; our aim was to propose a set of strategies that top managers are *likely* to use, rather than should use, in their struggle to attenuate the stigma of Chapter 11.

The strategies presented in Table 3 can be viewed as a continuum reflecting the extent to which top management acknowledges the stigma of bankruptcy to organizational audiences. At one extreme, concealing entails avoiding any acknowledgment that Chapter 11 has occurred or will occur. Defining and denying responsibility both entail acknowledging that a potentially stigmatizing event has occurred. Those two strategies also convey, however, that top management and the firm are not, or should not be, discredited. Leaders who accept responsibility for a bankruptcy are admitting some blame for their organization's spoiled image and thus acknowledging that their own image may be somewhat tarnished. But, as will be discussed, accepting blame is a strategy that is sometimes used to convince organizational audiences that top management deserves only secondary, rather than primary, blame for a bankruptcy. In contrast, although the message is implicit, with-

TABLE 3
Stigma-Management Strategies in Four Cases of Bankruptcy[a]

Strategies	Visionary Computers[b]	Perfect Peripherals	Enoch Computers	Mega Peripherals	Examples
Concealing					
Passive	i	I	I, o	I, p	We have no duty or any inclination to tell them [potential customers] that we're under the protection of bankruptcy. (Lawyer)
Active	i	i, a	I, C	I	I made a personal visit to sit in front of Sue and look her in the eye because a lot of business is done on good faith in this world . . . . She assured me that the firm was in sound financial condition. (Creditor)
Defining					
Explaining the Chapter 11 label	I, p	I	I, P	I	And Charlie explained what Chapter 11 really means that there quote, unquote, there still is hope, you know. That it's not the final answer, the final word. (Vice-president of engineering)
Invoking uniqueness	I	I	I, O, p	I	They told everybody that the only reason they filed Chapter 11 was because of the dispute they had with the landlord over their right to sublease. (Creditor)
Denying responsibility					
Blaming the environment	I	I	I, O, p	I, a	The marketplace went away and the Japanese competition came on board. (President) The negative financial situation was completely because of external situations. (Founder and ex-president)

TABLE 3 (continued)

Strategies	Visionary Computers[b]	Perfect Peripherals	Enoch Computers	Mega Peripherals	Examples
Blaming others in the firm who are no longer employed	I	I, A	I	I	The [former] president was unable or unwilling to recognize that and do anything about it. (President)
Accepting responsibility	I		O	i	If I had been a little more experienced, perhaps I may have been able to cope with it better. (President) Well, I guess I hold the board responsible, of whom I was a member . . . yes, I admit that I was responsible for the problems we had with the [product] . . . . I'm really sorry that it happened. It didn't need to happen. (Founder and ex-president)
Withdrawing	I, P	p, A	p	i, p	I just don't want to talk about it. (Founder and ex-president) And there are times when I won't answer the phone. (President)

drawing or hiding from organizational audiences who are reacting nega-
tively is often interpreted as a strong acknowledgment of the stigma of
Chapter 11. Audience members often construe withdrawal as an indication
that leaders are unable to develop any strategy to improve spoiled individual
and organizational images.

Concealing

The strategy of concealing a bankruptcy from an organizational audience
can be passive, as when an organization does nothing to change an audience's
ignorance of the fact of Chapter 11, or active, as when management makes
deceptive public statements. We encountered examples of both variations of
concealing (see Table 3).

The strategy of "passing," or pretending to be something other than what
one really is (Goffman, 1963), may require both covert and overt concealing
of the facts. Leaders may avoid situations in which they must reveal the fact
of bankruptcy. By not revealing the bankruptcy, they have passively rein-
forced their firm's unstained image without having to make a deceptive
statement (Page, 1984). Enoch Computers' lawyer recommended this tech-
nique, saying "We have no duty or any inclination to tell them that we're
under the protection of bankruptcy." Similarly, the director of software of
Visionary Computers reported that "unless one of our potential customers
asks, we won't tell them."

Persistent evidence of active concealing (Berk, 1977; Page, 1984) was
also encountered; creditors and other audience members often contended
that members of a bankrupt firm's management had lied to them. In an
attempt to present an organization as an unsoiled entity, managers would
seemingly misrepresent their firm's financial condition. Leaders told us
and told audience members that such deception was occasionally necessary
so as not to prejudice court cases or to reveal company secrets. Managers and
their lawyers also concealed bankruptcy because they believed that organiza-
tional audiences would back out of relationships if the severity of their
firm's predicament was discovered. The vice-president of human resources
for Perfect Peripherals stated:

> Perfect's management and board chose to take a very secretive
> approach all the way up to the end. The position that the board
> had taken was "if we're going to make it at all we need to retain
> the employees who are left." Therefore we encouraged people to
> stay even though I knew we were going out of business.

Concealing strategies have at least two major functions. If the concealing
strategy is successful, then an organization and its members do not have to
cope with a sent stigma since it has been eliminated before it can occur. Of
course, many audiences will eventually discover that a firm is bankrupt,
unless the bankruptcy is somehow avoided. But concealing can be effective
as a temporary measure, even if bankruptcy cannot be kept secret perma-
nently. Temporary secrecy may allow top managers enough time to regain
composure and to present a coherent story to their key audiences (Schenkler,

1980). Comments by the president of Mega Peripherals about his attempts to find a buyer for the company reflect that idea:

> I felt that I would have had a stronger case in doing that or at least in negotiating the deal outside of an 11, even though an 11 may have had to be the vehicle through which such a transaction was carried out.

There are also dysfunctions associated with concealing strategies. A primary drawback is that concealing is often unethical and sometimes unlawful. Further, if key audiences perceive that top management is attempting to conceal vital information, the strategy may cause loss of trust. Top management may find it impossible to convince deceived audiences to continue their relationship with a firm (Schenkler, 1980). A member of the creditors' committee for Enoch Computers summed up such feelings as follows:

> The attitude of the members of the creditors' committee when they first got started was "They lied to me! Those SOB's burned me for a bunch of money, I'll never do anything for them again!"

Defining

The strategy of defining allows top management to acknowledge that something has happened without having to admit that the predicament is discrediting. In effect, the leaders convey to organizational audiences that something has happened that appears to be discrediting but is really misunderstood.

This strategy may take one of two forms. First, leaders may take the approach that there is a general misunderstanding among audience members about the meaning of bankruptcy and Chapter 11. Managers may use an attempt to neutralize the label of Chapter 11, or stigma disavowal (Page, 1984), to correct either the label or the situation. Such an attempt is analogous to the "disconfirmation of stereotypes" described in the literature on stigma management (Goffman, 1963; Jones et al., 1984: 180–184).

An attempt to educate organizational audiences about the so-called true nature of bankruptcy occurred in each of the four organizations studied. The examples in Table 3, along with the following quote from a lawyer for Enoch Computers, illustrate that strategy:

> Most people have an aversion to the word bankruptcy ... so I go in and I tell them, "There's nothing to be ashamed of. Financial distress doesn't mean that you're guilty of misconduct or mismanagement. Financial distress strikes Chrysler and Lockheed and you name 'em. That doesn't mean those companies are guilty of mismanagement."

Claims of uniqueness (Martin, Feldman, Hatch, & Sitkin, 1983) are the second variation of defining the situation that management may use. It can be viewed as a form of the "defense of nonoccurrence" described by Schenkler: "the actor tries to show that the event under consideration did not occur" (1980: 138). Specifically, top management tries to show that although their organization has filed for Chapter 11, the firm is unique,

or at least unusual, because it was *not* forced into Chapter 11 by the occurrence of financial problems.

Statements like "Our company is different; we didn't file Chapter 11 because of financial disaster but because . . ." were frequent; various explanations of how the company was unique would follow. Rather than acknowledging that Chapter 11 was evidence of poor financial control on the part of top management, top managers tried to transform the bankruptcy into an event that permitted their organization to proceed in a direction that would have been impossible otherwise. Table 3 indicates that such claims were present in all four firms and that several members of each organization made them. The following quotes further illustrate claims of uniqueness:

> We analyzed state law for eviction in those circumstances with bankruptcy law in eviction and concluded that there were additional protections available for the debtor under federal bankruptcy law that improved his chances of success against the landlord . . . so the precipitating factor that triggered the bankruptcy in the case was that circumstance. (A lawyer for Enoch Computers.)

> The bankruptcy laws provide that you can't resurrect terminated leases and the issue is pending right before the bankruptcy court. They say that's why they filed a Chapter 11 petition. (A lawyer for Enoch Computers' creditors' committee.)

Because both varieties of defining permit management to acknowledge the situation, the risk of alienating the remaining audiences is less than it is with concealing. Management can demonstrate to key audiences that—despite appearances—a discrediting event has not occurred.

A dysfunction also exists. As with concealing, if an audience construes that top management has misrepresented the situation, it feels that its trust has been violated, and it is difficult for an organization to continue the relationship. The cost may not be as high as when an organization unsuccessfully attempts to conceal its predicament, but loss of trust can occur.

Denying Responsibility

Denying is another strategy that was present in each of the four bankruptcies. In this strategy, top management acknowledges that something discrediting has occurred but denies responsibility for the occurrence. One strategy that was prevalent throughout the study (see Table 3) is the "defense of noncausation" (Schenkler, 1980: 138), in which top management states that a bankruptcy is the fault of the environment. Organizational research on self-serving attributions indicates that leaders of troubled firms use that strategy frequently (Bettman & Weitz, 1983; Ford, 1985; Staw, McKechnie, & Puffer, 1983). Along those lines, the president of Mega Peripherals justified the organization's filing for Chapter 11 by arguing that "The marketplace went away and the Japanese competition came right on board."

There are other sources that can be blamed. Scapegoating of past leaders was present in all four organizations. As did a previous case study of layoffs at the Atari Corporation (Sutton, Eisenhardt, & Jucker, 1986), the present

research indicated that blame was often placed on people no longer associated with the organization and therefore unable to defend themselves against accusations (see Table 3). To illustrate:

> Vladmir (the former president) had no real management skill. He had lost touch with the product and refused to believe that the product had serious problems. Because of that he began to dismiss key people, and that led to the demise of Visionary. (President, Visionary Computers.)

Remaining members of top management teams did much of the finger-pointing at former leaders. One function of blaming former leaders is that it allows current leaders to appear to organizational audiences as unsullied by the stain of bankruptcy, a variation of the instrumental scapegoating described by Bonazzi (1983). Once again, top managers used Schenkler's (1980) defense of noncausation in attempts to repair the spoiled images of the organizations and their leaders.

Denying responsibility can also be dysfunctional for members of top management. Leaders who claim that Chapter 11 was caused by uncontrollable events may be spoiling their image further. As was noted, people expect competent leaders to exercise effective control of their organizations (Pfeffer, 1981; Salancik & Meindl, 1984). Blaming external forces may backfire because members of top management are presenting an image that makes it difficult to claim the status associated with the managerial role.

Another reason denying responsibility may be dysfunctional for leaders is because organizational audiences may see it as merely making excuses. Schenkler (1980) proposed that excuses do not have the effect of eliminating responsibility, but only of mitigating it. When leaders deny all responsibility for a predicament, but audience members perceive that they are at least partly to blame, any sympathy that existed for a bankrupt firm may disappear, and further damage to already tarnished images may result (Jones et al., 1984). To illustrate:

> Everybody knew they had been very slow in paying. But they told everybody that the only reason they filed Chapter 11 was because of the dispute with the landlord over their right to sublease. I mean anybody who leases property in business knows you don't just make an alteration to the property without the landlord's consent. It's incredibly poor management, incredibly poor. I'm sure that the credit committee is going to try and pierce the corporate veil and basically say that we cannot allow that to go on. (A supplier for Enoch Computers.)

Accepting Responsibility

The strategy of admitting that something discrediting had happened and accepting responsibility for it was observed less frequently than concealing, defining, or denying responsibility (see Table 3). The strategy, which we encountered in investigating three of the four firms, was the only stigma-management strategy not encountered in all four. Nonetheless, top managers accepted blame more frequently than social-psychological studies on self-serving attributions might suggest (Nisbett & Ross, 1980; Weiner, 1971).

In the case of Visionary Computers, the founder was at first willing to accept complete responsibility in his discussions with creditors, board members, and fellow top managers. He told us during our first interview:

> I can't blame anyone else for the failure of my company. It was my fault and I am completely responsible for what happened. I'm sorry that it happened.

By the second interview, six months later, he had modified his thinking (see Table 3). Although still accepting some responsiblity for the bankruptcy, he no longer felt completely at fault. The strategy of accepting partial responsibility and conveying such acceptance to key organizational audiences was used at Visionary Computers, Enoch Computers, and Mega Peripherals. To illustrate, the current president of Visionary attributed most of the blame to the previous president. But he did admit one mistake:

> Visionary was unique. Ninety percent of the time I force the issue so that I have absolute control of the corporation—of the board of directors. If I tell somebody I don't want them on the board, they're off the board. In this case I didn't do it. That was a mistake on my part.

Schenkler (1980) proposed that the partial acceptance of responsibility is functional for at least two reasons. First, it allows the members of top management to garner sympathy from other participants. By admitting responsibility for a portion of the problem, managers present themselves as good people who have tried their best. Organizational actors may continue dealing with the bankrupt firm for emotional reasons, like feeling sorry for management, rather than economic reasons.

Perhaps a more important function of accepting some of the responsibility for an organizational predicament is the legitimation of other claims (Jones et al., 1984; Schenkler, 1980; Sutton, 1983, 1984). Accepting partial responsibility also has the advantage of increasing top management's credibility (Schenkler, 1980). Credibility with respect to specific incidents may then be extended to related circumstances.

If members of top management deny all responsibility for a bankruptcy, then the face they present will be inconsistent with audience expectations of a strong link between managerial action and organizational performance. But accepting all responsibility implies incompetence. Accepting partial responsibility, however, may enable leaders to cope with that nasty dilemma. By accepting blame for *secondary* causes of the bankruptcy, leaders' claims that they do not deserve blame for the *primary* causes are more likely to be accepted.

Salancik and Meindl (1984) presented an alternative explanation for the strategy of acceptance. By accepting responsibility for the fate of a firm, top management may be enhancing the illusion of management control. Statements of informants that take the form "If I had to do it all over again . . ." reinforce the concept that managerial action determines the course of an organization and confirm that managers are indeed necessary.

Such statements also imply that a manager has learned from past mistakes. The acceptance of responsibility with an added "but I learned something and would never make that mistake again" may be an attempt on the part of a manager to present him or herself in an enhanced light when seeking future employment:

> The more you push me, the more I stick. I get calls from head-hunters all the time. This place is a better education than college. (A service manager, Visionary Computers.)

Nonetheless, even partial acceptance of responsibility can be dysfunctional for members of top management. Building on Schlenker (1980), we suggest that an audience may believe an admission of self-blame but may not believe that managers have learned from their mistakes and will now be able to turn a troubled firm around. For example, creditors of Enoch Computers believed the president when he said "Look, we have made some mistakes." But the creditors did not believe him when he introduced plans for a new product that was "going to make millions."

Withdrawing

The last stigma-management strategy identified during this study was withdrawing. Withdrawing from an organizational audience whose members know of the predicament can be interpreted as an admission by top management that something discrediting has occurred. By refusing to participate in any activity that might reduce the stain of bankruptcy, management may unintentionally convey to organizational audiences that the stigma is indeed applicable (Berk, 1977; Goffman, 1963; Jones et al., 1984; Page, 1984; Schenkler, 1980).

Periods of withdrawing range from brief to extended. If a retreat from an organizational audience is brief, it is similar to temporary, passive concealing because it may allow top management a chance to marshal forces and develop plans for managing a predicament (Schenkler, 1980). It differs from temporary concealing because audience members know that top management is hiding from them. Audience members may assume that only those who have something to be ashamed of will hide (Schenkler, 1980). Thus, brief withdrawal can anger members of an organizational audience. An executive who told us that "sometimes I won't answer the phone" admitted that after avoiding creditors "you really have to go out of your way to placate them."

Extended withdrawal was encountered less frequently than brief withdrawal. One executive did state that he "categorically refused to be a part of that situation in any way." His refusal to talk to us bore that out; he also refused to talk with other members of his company about the firm's predicament, and later he declined to be interviewed for a feature article on the closing of the company.

Although an extended period of withdrawal may reduce unpleasant interactions with organizational audiences, it does not eliminate the predicament. Even more so than a brief withdrawal, it may cause a situation to

worsen (Schenkler, 1980). If members of top management are eventually confronted by audience members after refusing to deal with them, they may discover that any hope of repairing damaged relationships will have vanished, and only hard feelings remain. The following quote illustrates that dysfunction of withdrawal:

> They dragged it out indefinitely and nobody was ever willing to to sit down and speak frankly about what it would take, I don't mean to be melodramatic but, to save the company. And as a result, they had to liquidate. (Vice-president of human resources, Perfect Peripherals.)

DISCUSSION

A qualitative and inductive study of four firms led us to describe Chapter 11 of the Federal Bankruptcy Code as a label that can spoil the intertwined images of organizations and their top managements. The stigma of Chapter 11 is proposed to cause key organizational audiences to respond with a set of five negative reactions: disengagement, reduction in the quality of participation, bargaining for more favorable exchange relationships, denigration via rumor, and denigration via confrontation. We also proposed a hierarchy of five techniques that leaders will use to avert or reduce the stigma of Chapter 11: concealing, defining, denying responsibility, accepting responsibility, and withdrawing.

This conceptual perspective should be viewed with some caution, however, because of methodological limitations of the present study. If this were a deductive study, its most serious limitation would be the small, homogeneous group of firms studied. Because the purpose of the present study was to develop, rather than test, theory, we drew on detailed descriptions of a small number of organizations or individuals—an approach thought to be best for inspiring and guiding the development of new theories (Glaser & Strauss, 1967; Mintzberg, 1979).

The most troublesome methodological drawback for theory building was that we could not spend enough time at each firm observing the interactions between top management and other organizational audience members. We learned this lesson at the creditors' committee meeting, which provided some of the most important data gathered. But we were not invited to other meetings, despite our polite requests. Perhaps participant observation is the best approach for future inductive research.

As for potential conceptual drawbacks, the use of the stigma metaphor may have led us to exaggerate the perils of Chapter 11 and to underestimate the benefits. The legal and financial benefits of Chapter 11 have been discussed widely (Nelson, 1981; Platt, 1985). Moreover, although we focused on the negative aspects of stigma, being discredited can be functional (Goffman, 1963). We observed that top management used Chapter 11 as a reason to ignore tasks and to garner sympathy from stakeholders. One manager was called about joining the local chamber of commerce; he angrily told the caller that the firm was in Chapter 11 and could not be expected to donate

money. One president almost begged creditors not to put him out of business, and they were hesitant to close the company partly because he looked physically and psychologically beaten.

Despite limitations, the present study suggests at least four important topics for future research. First, Chapter 11 is not the only predicament that can spoil the intertwined images of organizations and leaders. Events that cause mass deaths and illnesses, such as the chemical spill at Union Carbide's plant in Bhophal, India (Lueck, 1984) and Jalisco Cheese's selling a tainted product (Soble, 1985) may evoke stigma. Allegedly criminal acts like E. F. Hutton's check-kiting scheme and General Dynamics' unsavory practices (Kleinfield, 1985) may also evoke stigma. The present study proposed a middle-range theory (Merton, 1957; Weick, 1974). But the five negative reactions and their effects on firms and leaders proposed in Figure 1 could help guide efforts to build a general theory about discrediting organizational predicaments. And the stigma-management strategies proposed in Table 3 may be useful points of departure for building a general theory of image or impression management during an organizational predicament.

Second, this study focused on similarities across the reactions of organizational audiences and top management when firms filed for Chapter 11. Yet, as occurs with theories proposed to explain differences across firms, the match between the proposed constant elements and the case data was imperfect. Those mismatches may provide clues about important differences among bankruptcies.

Enoch Computers, for example, was the only case in which no reduction in the quality of participation was observed. A resource-dependence perspective (Pfeffer & Salancik, 1978) may help explain why that firm differed from the others. Enoch was the primary customer for the parts produced by two major suppliers. Moreover, employees at all hierarchical levels had only firm-specific skills that were of little value to other organizations. Since suppliers and employees had few options outside the firm, the quality of their participation remained high because their financial well-being depended on the survival of the firm. In contrast, the suppliers of the three firms in which the quality of participation decreased had many customers, and most of their employees had adequate external employment options.

Third, we proposed five strategies that leaders of bankrupt companies may use to avert or reduce the stigma of Chapter 11 but offered no propositions about the relative effectiveness of those strategies. Hypotheses could be advanced about the contingencies under which each strategy is most and least effective. For example, the limited evidence from this study suggests that although concealing is a poor—and perhaps unethical—long-term strategy, it is a useful short-term strategy. Concealing gives leaders time to regain their composure and develop more sophisticated defining, denying, and accepting strategies.

We are especially interested in the conditions under which accepting blame for a bankruptcy is effective. Salancik and Meindl's (1984) work suggested that accepting blame for poor organizational performance helps create

the illusion that leaders can control organizational environments that are objectively uncontrollable. But accepting responsibility may also be effective under other conditions. For example, leaders and their organizations may benefit from offering apologies. Although such a technique appears to be more common in the Japan than United States, Schenkler's (1980) writings on impression management suggest that if audience members are convinced of the sincerity of an apology, they will be unlikely to punish an actor further—unless they want revenge.

Fourth and finally, the evidence we gathered suggests that future work should consider the role of humor in bankrupt firms. No matter how effective managers are at implementing stigma-management strategies, Chapter 11 creates tensions between top managers and organizational audiences. Anthropologists, including Radcliffe-Brown (1952), have argued that joking relationships, or permitted disrespect, serve the function of maintaining a satisfactory relationship between people who have social ties that might generate hostility. Similarly, Freud (1960) contended that jokes release tension about issues that make people uncomfortable, and writings on stigma have indicated that those who convey and feel stigma use humor in order to ease tension (Goffman, 1963).

The need to ease unavoidable tensions may explain the persistent joking and laughing that occurred during interviews, casual conversations among members of bankrupt firms, and the creditors' committee meeting that we observed. One president, a bald and wrinkled fellow who was about 50 years old, joked: "I'm a turnaround expert. I'm 28 years old." The president of Mega Peripherals told us several nasty jokes about lawyers, including: "My definition of waste is a busload of attorneys going off a cliff with two empty seats."[6]

The role of humor in Chapter 11 and in other organizational predicaments may be a useful subject for future theory building. Humor may be an effective means for implementing some of the stigma-management strategies described above, especially denying responsibility. And humor may stand alone as a separate stigma-management strategy.

In closing, it is important to recall that we have proposed, rather than tested, a conceptual perspective. We assert that conducting a systematic qualitative study—rather than relying exclusively on imagination and published works—is a sound means for theory building (Glaser & Strauss, 1967). Hypothesis-testing research, however, should be conducted to assess whether organizational audiences perceive bankruptcy as discrediting and whether that stigma leads to negative reactions that further damage bankrupt organiza-

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[6] Bankruptcy lawyers are paid before all creditors, and they typically demand payment in advance. Creditors and members of top management often became angry about how much lawyers gained from this system. The president of Mega Peripherals ranted: "They're vultures. They're just around to pick bones. [They are only concerned with questions such as:] How soon can I liquidate that sucker? How can I maximize the billable hours?" Even relatively neutral observers have questioned the large financial gains that lawyers enjoy under the current system of bankruptcy laws (Aaron, 1979).

tions and their leaders. Deductive research could also help determine if the five stigma-management strategies are constant elements across all bankruptcies.

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UNDERSTANDING ORGANIZATIONAL WAGE STRUCTURES: A RESOURCE DEPENDENCE APPROACH

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Data on the salaries for high level administrative positions in 608 colleges and universities were used to examine the relative salaries for six positions. Controlling for other factors, we found that the incumbents of positions that were more important in private institutions than in public ones were paid comparatively more in private than in public settings. Incumbents of positions that were more important in public institutions received comparatively more pay in those places. The results suggest that the criticality of a position, a factor that varies across work contexts, can help account for variation in wage structures across organizations.

There is a growing realization that the salary paid to the incumbent of a given position depends not only on the characteristics of the incumbent and the position but also on the characteristics of the organization in which the position is located (Granovetter, 1981). That realization has led to the emergence of a literature examining the effects of various organizational characteristics on salaries. For example, theorists have studied the effects of organizational size (Carroll & Mayer, 1986; Kalleberg, Wallace, & Althauser, 1981; Stolzenberg, 1978), growth (Rosenbaum, 1979; Stewman & Konda, 1983), demography (Borjas, 1980; Stewman & Konda, 1983), unionization (Duncan & Stafford, 1980; Freeman & Medoff, 1984; Johnson, 1975; Lewis, 1963), and organizational power (Borjas, 1980; Dalton & Ford, 1977) on the salaries of organizational members.

The emerging interest in the effects of organizational characteristics on individual salaries is partially a response to models of wage determination that assume that organizational attributes have little effect on individual earnings. For example, human capital theories suggest that individual wages are primarily a function of individual attributes, such as education, tenure, and total experience in the labor force, and that returns to individual attributes are similar across organizations (Mincer, 1970).

To date, most studies of the effects of organizational characteristics on salaries have examined how organizational attributes affect individual wage levels. However, very few studies have examined how organizational and positional characteristics affect the wage for a position relative to the wages for other positions in a firm. Consequently, although scholars are beginning to understand some of the determinants of wage *levels*, we know relatively little about the determinants of organizational wage *structures*, by which we mean the relative salaries for positions within organizations.

Understanding the determinants of organizational wage structures is important for several reasons. First, studying the effects of organizational characteristics on relative wages can enhance our understanding of how organizational and positional attributes interact to affect individual wage levels. Past research has suggested that organizational, positional, and individual attributes all have main effects on individual wages (Bridges & Berk, 1974; Carroll & Mayer, 1986; Hodson, 1984; Kalleberg et al., 1981). However, it seems likely that there are circumstances under which organizational and positional attributes interact to affect individual wages. For example, if the importance of a position affects the wages paid to the incumbent, and if similar positions differ in importance across various types of organizations, then it is likely that organizational attributes will interact with type of position to affect individual wages. Studies of the effect of organizational attributes on the relative wages of various positions may help illuminate the kinds of organizational and positional attributes that interact to affect wages.

Second, scholars concerned with relative deprivation and distributive justice have argued that the distribution of wages across positions has important effects on both attitudes like job satisfaction (Cook, Crosby, & Hennigan, 1977; Martin, 1981) and on phenomena incorporating individual and collective behaviors like turnover, strikes, and unionization (Martin & Murray, 1984). Wootton noted, "In a hierarchical society such as ours, large issues of social status are involved in wage and salary scales. Pay and prestige are closely linked" (1955: 68).

Third, the issue of relative wages is at the heart of a theory of wages and incomes. As Dunlop noted:

> Wage theory must operate with the concept of *wage structure*—the complex of rates within firms differentiated by occupation and employee and the complex of interfirm rate structures . . . . Indeed, the task of analyzing wage determination is not the problem of setting a single rate but rather the problem of setting and variation in the whole structure or complex of rates (1957: 128).

Livernash also argued for the importance of understanding wage differentials and maintained that "there simply is no compulsion of market forces adequate to explain the detailed determination of wage differentials" (1957: 141). Economic theories of relative wages have not been, and are not, very helpful in understanding wage structures since "particular wage rates are set by administrative decision within the firm" (Livernash, 1957: 145). Thus, to understand wage structures, we need to understand the administrative ar-

rangements and organizational forces that produce a particular set of relative wages.

This study focused on one positional characteristic that is particularly likely to affect organizational wage structures—the importance of a position. We argue that within a given type of institution some positions are more critical or important than others and are therefore likely to be assigned higher salaries (Hickson, Hinings, Lee, Schneck, & Pennings, 1971; Pfeffer & Salancik, 1978). We then test that idea by examining how the relative salaries of high level administrative positions differ in public and private universities.

BACKGROUND AND HYPOTHESES

The literature on organizational wage structures has focused largely on the effect of hierarchical level on the relative wages for positions. For example, Whisler, Meyer, Baum, and Sorensen (1967) argued that the extent to which high salaries tended to be concentrated among high-level positions was an indicator of organizational centralization. Simon (1957) noted that there are strong norms assuring that salary differences accompany hierarchical differences between positions. The use of salaries to demarcate hierarchical levels implies that the greater the number of levels, the greater the degree of wage inequality and dispersion of relative wages. Mahoney (1979) empirically examined Simon's idea about reasonable differences in salaries across hierarchical levels and found that norms about appropriate interlevel salary differences do in fact exist.

A similar emphasis on hierarchical wage differentiation is found in Abrahamson's (1973) test of the predictions Stinchcombe (1963) derived from Davis and Moore's (1945) functional theory of stratification. Stinchcombe suggested that the degree of hierarchical wage differentiation varies across organizational settings. He argued that organizational wage inequality would be greater when individual activities are "talent complementary" rather than "talent additive." When activities are talent complementary, an individual's performance can add disproportionately to organizational output. However, when activities are talent additive, each person's output contributes more or less equally to total organizational output, and disproportionate contributions are not possible. Abrahamson (1973) argued that because research universities have higher levels of talent complementarity than teaching universities, they should have more wage dispersion across hierarchical levels. To test that idea, Abrahamson examined the ratio of full professors' salaries to those of associate professors and the ratio of associate to assistant professors' salaries across a sample of universities. His finding, that inequality was greater across ranks in research universities than in teaching universities, was consistent with Stinchcombe's argument.

This study moves beyond the notion that the hierarchical level of a position affects its relative salary to examine differentiation in relative wages based on the importance of a position. Although there has been little empirical work pertaining to the issue, a number of theoretical perspectives predict

that in a given organizational context incumbents of critical positions will be better compensated than those holding less critical jobs. If wage rates at least partly reflect the power of various positions in an organization, that prediction is quite consistent with either the strategic contingencies approach of Hickson and colleagues (1971) or Pfeffer and Salancik's (1978) resource dependence perspective. Both sets of theorists have noted that, because of the division of labor within organizations, some positions wind up in control of more critical tasks. In the strategic contingencies approach, criticality derives from the ability a position gives its incumbent to cope successfully with uncertainty, the pervasiveness of the position's activities, its centrality to the organization involved, and the availability to the organization of alternative means of coping with that uncertainty. In the resource dependence approach, criticality derives from the ability a position gives its incumbent to provide resources to an organization or to solve its resource acquisition problems and, as in the strategic contingencies approach, from the extent to which such resource acquisition activities can also be performed by individuals in other positions. Both perspectives bear some similarity to Davis and Moore's (1945) functional theory of stratification; summarizing that theory, Huaco wrote, "The system attaches greater rewards to the functionally more important positions in order to insure that the individuals with the greatest talent and training occupy those positions" (1970: 215).

    In the empirical study that is closest in intent and unit of analysis to the present research, Abrahamson (1979) examined the effect of a position's importance and uniqueness on the salaries paid to individuals holding the nine positions on 12 baseball teams in 1965 and 1976. He operationally measured a position's importance by correlating the effect of dimensions of performance like batting averages and fielding percentages for each position with a team's overall success, measured as win-loss percentage, team standing, and financial performance. Abrahamson found that the functional importance of a position, its uniqueness, and the interaction of importance and uniqueness were all significantly associated with salary. The study is noteworthy for its operational definition of functional importance and for its focus on organizational, rather than societal, stratification. It assumed, however, that a position's importance is constant across all teams, regardless of their strategy or composition.

    One potential problem with all three perspectives is that they can lead to tautological reasoning. If researchers are not careful, they may end up using the same variables as indicators of both the degree of a position's importance and the consequences of that importance. For example, a proponent of Davis and Moore's (1945) functional theory of stratification might argue that organizations assign the highest salaries to the most important positions and that high salaries are therefore a good measure of a position's importance.[1] To avoid that difficulty, researchers need to be able to assess the level of a position's criticality that is independent of the presumed consequences of its

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[1] See Huaco (1970) for a discussion of this problem.

criticality. In this research, we avoided the problem by identifying eight positions that we expected a priori to have different levels of importance in public and private universities because of the different resource acquisition contingencies those two types of institutions face. We then followed Tolbert's (1985) method for assessing a position's importance to determine whether our expectations were correct. Our general hypothesis is that individuals occupying positions that are more important in private institutions than they are in public institutions and who work in private ones should receive higher relative salaries than their counterparts in public institutions. Conversely, among individuals occupying positions that are more important in public than in private institutions, those who work in private institutions should receive lower relative wages than those working in public institutions.

Because we were interested in examining wage structures, we needed to select a set of positions that met two criteria: (a) they exist in most academic institutions—we did not chose, for example, the position of dean of veterinary medicine, which exists in few schools—and (b) they lend themselves to the making of reasonable a priori predictions about their differential importance in public and private institutions. On the basis of those two criteria, we identified the following positions: community services director, chief development officer, admissions director, student placement director, alumni affairs director, chief public relations officer, chief business officer, and athletic director.

Private universities depend on tuition and donations as major sources of funding. Moreover, in the late 1970s and early 1980s, there was strong financial pressure on private universities because of declining college enrollments, inflation, and increased competition from state universities with lower tuition. Therefore, it is reasonable to argue that, of the positions selected, the following will be more critical for this period in private universities: chief development officer, alumni affairs director, admissions director, and chief business officer. Because alumni make many donations to those institutions, development is clearly a critical task for them. Obtaining and processing admissions in a way that maintains good relations with donors and keeps the stream of revenue from tuition going is also critical in private universities. Finally, because most such colleges and universities have recently faced a need for financial stringency, the position of chief business officer, with responsibility for financial management, should also be particularly critical for them.

In contrast, public universities depend less on tuition and donations and more on political support derived from the broader community. Therefore, positions like director of community services, chief public relations officer, athletic director, and student placement director should be critical in public universities. In the case of community services, which includes extension activities, and public relations, the argument is quite straightforward. Activities that reach and are visible to a large number of people in a community and publicizing such activities to a large audience are particularly important for public universities. Athletics provides general visibility for a school as well as entertainment for the surrounding community. Student placement

serves local business communities by providing both full- and part-time employees. It should be particularly critical to many students attending public universities because, on average, graduates of private universities come from higher socioeconomic origins than graduates of public universities (Zemsky & Oedel, 1983) and thus can gain access to job networks through personal contacts and family connections (Granovetter, 1974). Thus, because of its service to both the business community and students, placement should be more important in public than in private universities.

Those expectations are generally consistent with recent research by Tolbert (1985) examining the presence or absence of six positions in public and private universities. She demonstrated that differences in funding sources between private and public universities are associated with differences in the types of positions present. Private institutions were more likely to have positions related to securing and administering tuition and gifts, and public institutions were more likely to have positions related to obtaining government funding. Specifically, a significantly greater percentage of private than of public institutions had a chief development officer and a director of admissions. Also, a larger percentage of private institutions had a director of alumni relations, although that difference was not significant. On the other hand, a greater percentage of public institutions had a chief planning officer, a director of information, and a director of institutional research.

Data from 334 private institutions and 274 public ones were used to test our expectations about the relative criticality of the eight positions we selected. Table 1 presents the percentages of public and private institutions reporting each position. Following Tolbert's (1985) reasoning, we expected that the positions that should be more critical in private institutions than in public institutions—chief development officer, director of admissions, chief business officer, and alumni affairs director—would occur more frequently in private colleges and universities than in public ones. We also expected that positions that should be more critical in public institutions—director of community services, of placement, of athletics, and chief public relations officer—would exist more frequently in those institutions. For the most part, the data in Table 1 confirm our expectations. A larger percentage of private than public institutions reported the presence of a chief development officer and of admissions and alumni directors. A larger percentage of public than private institutions reported the presence of a community services, a placement, and an athletic director. However, the data do not confirm our expectations regarding the criticality of the position of chief business officer or chief public relations officer. Those two positions occur about equally often in the two types of institutions. Because those positions do not differ on Tolbert's indicator of criticality, we did not analyze them further in terms of relative salaries. Tolbert's research provided a measure of the criticality of administrative positions that is independent of salary. In most instances, the measure confirmed our a priori expectations and yielded an empirical indicator of a position's criticality.

TABLE 1
Percentages of Public and Private Institutions
Reporting Eight Administrative Positions[a]

	1978		1983	
Administrative Positions	Public	Private	Public	Private
Chief development officer	40.4	68.8***	48.9	77.2***
Director of admissions	75.9	81.3	74.8	81.7*
Chief business officer	93.7	87.2**	94.2	91.3
Director of alumni affairs	57.0	71.4***	62.4	75.4***
Director of community services	20.4	12.5**	15.0	9.0*
Director of student placement	78.5	65.8***	82.5	76.3†
Director of athletics	82.6	69.6***	76.6	69.8†
Chief public relations officer	50.0	54.5	55.1	61.4

[a] This table is based on data from 334 private institutions and 274 public institutions.
    † $p < .10$, based on a t-test for the difference between proportions.
    * $p < .05$
    ** $p < .01$
    *** $p < .001$

DATA AND METHODS

The data used to examine relative salary levels were taken from the College and University Personnel Association's annual administrative compensation surveys for 1978–79 and 1983–84. Those surveys report salary compensation for a set of high-level university administrative positions, including president, vice-president, financial or legal officer, director of student services, director of a computer center, director of a research facility, director of an alumni or a community relations program, and dean. In each institution surveyed, each position had only one incumbent.

The survey gave a brief description of the duties considered to define each position and asked respondents to report several pieces of information about the position and its incumbent. It directed respondents to use the description of a position's duties, rather than the position's title, to determine which position in their institution corresponded to a position listed in the survey. Therefore, respondents could answer the questions even if the titles of positions used in their institutions were not exactly the same as those used in the survey. For example, the 1983 survey described the duties of a chief development officer as follows: "The senior administrative official responsible for institutional development programs. Incumbent typically leads the institutional fundraising and, in the absence of an organizational co-equal specifically assigned to the function, public relations, alumni relations, and information office activities" (College and University Personnel Association, 1983–84: 125).

To ensure comparability over time, only those institutions responding in both time periods were included in the analysis. We also eliminated schools that were only law schools, medical schools, or religious seminaries. Because two-year colleges are quite different from four-year institutions, we

eliminated the former. The group studied consisted of 608 four-year colleges and universities.

For each position, we wanted to define a dependent variable that would index its location in an institution's compensation structure. The variable we selected was the wage paid to a position's incumbent divided by the mean wage for all administrative positions reported by the institution.[2] In 1978 colleges and universities could report on as many as 75 positions, but in 1983 they could report on as many as 99 positions. We did not want to look solely at the actual wage for a given position because variables that affect the overall level of wages in a school affect actual wages. More important, in this study we were not interested in how much each alumni director earned but rather in how much the person in that position earned *compared* to people in other positions in the same administration. Therefore, comparing a position's salary to the mean salary for all administrative positions in an institution provided a frame of reference that implicitly controlled for the effects of salary level.

In addition to testing the effect of public or private support on relative salaries, we controlled for a number of individual and institutional characteristics that might also affect relative wages. Individual characteristics included in the analysis are: (1) gender of a position's incumbent, expressed as a dummy variable coded 1 for women and 0 for men; (2) minority status of a position's incumbent, expressed as a dummy variable coded 1 for members of ethnic minorities and 0 otherwise; (3) tenure of an incumbent in a position, measured in years; and (4) whether or not an incumbent was hired for a position from inside a university, expressed as a dummy variable coded 1 for inside hires and 0 for outside hires.

Because substantial past research indicates that jobs occupied by women and nonwhites pay less than jobs occupied by white men (Bielby & Baron, 1984; Featherman & Hauser, 1976; Malkiel & Malkiel, 1973; Rumberger & Carnoy, 1980), we expected that relative salaries would be lower for jobs with incumbents who were women or members of ethnic minorities. Similarly, there is substantial research suggesting that length of tenure is likely to be associated with higher relative salary (e.g., Medoff & Abraham, 1980; Mincer, 1970). Finally, we expected relative salary to be lower for individuals hired from inside an institution because, when an institution hires or promotes an internal candidate, it experiences less competitive wage pressure than when it hires or promotes from outside.

Institutional characteristics included were: (1) a set of dummy variables for geographic region—East, Midwest, South, Southwest, Northwest, West, with Northwest the omitted category; (2) a dummy variable for institutional

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[2] Of course, not all institutions had or reported on exactly the same positions. We believe that relative position in an entire administrative structure is the appropriate measure of salary structure. However, as is discussed more fully in the Results section, we also computed salary compared to the mean salary for just the six administrative positions we examined, thereby comparing the positions more directly to each other in terms of relative wages.

type, with 1 for universities and 0 for four-year colleges; (3) two variables measuring the level of resources available at an institution; and (4) a variable measuring institutional size, constructed from a factor analysis of full-time-equivalent (FTE) students, FTE faculty members, FTE staff members, and total budget. Those four items loaded on a single factor that explained 86 percent of the interitem variance in the 1978–79 academic year and 78 percent of the interitem variance in 1983–84. Scoring coefficients obtained from the factor analysis were used to construct a standardized factor score that was used in all subsequent analyses. We factor-analyzed the following ratios: FTE faculty/FTE students, total budget/FTE students, FTE staff/FTE students, total budget/FTE faculty, and FTE staff/FTE faculty. We used ratios because the abundance or scarcity of resources depends not only on absolute resource levels but also on how many persons those resources must serve. The factor analysis of the five ratios yielded two factors that jointly explained 81 percent of the interitem variance in the 1978–79 academic year and 77 percent in 1983–84. In the rotated factor structure, resources available to students, which were represented by the three ratios with FTE students in the denominator, loaded on the first factor, and resources available to faculty, represented by the two ratios with FTE faculty in the denominator, loaded on the second factor. We used scoring coefficients from the factor analysis to construct standardized factor scores for each of the two factors. We hereafter refer to those two scores as "student resources" and "faculty resources."

The geographical dummy variables were included to control for the effect on relative wages of geographical differences in either labor supply or norms about appropriate payment levels for a given position. Similarly, we included the other three variables to control for the possibility that the type, size, or resources of an institution in which a position is located may have some effect on its importance and therefore on the relative wages its incumbent receives. However, we developed no hypotheses about the effect of those variables because it is very difficult to specify a priori how they might affect the importance of the positions included in the analysis.

Finally, the independent variable of interest—whether an institution was public or private—was measured as a dummy variable coded 1 for private institutions and 0 for public institutions.

RESULTS

Table 2 shows the means and standard deviations for all variables. Only analyses for the 1978 data are presented.[3] Because the analysis for each of the six positions used a different subgroup of the full data set, it would require six separate correlation matrices to present the correlations between variables used in all of the analyses. To illustrate the nature of those correlations,

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[3] Full results for only the 1978 data are presented. However, analyses in Tables 2 through 5 were also performed on the 1983 data. In general, results for 1983 were similar to those obtained for 1978. Exceptions are noted in the text.

TABLE 2
Means and Standard Deviations[a] for All Variables for 1978–79

Variables	Chief Development Officer	Director of Admissions	Director of Alumni Affairs	Director of Community Services	Director of Student Placement	Director of Athletics
Percent mean	1.20	.89	.73	.88	.73	.99
salary	(.25)	(.15)	(.15)	(.25)	(.15)	(.17)
Size	.12	.12	.17	.32	.26	.24
	(1.10)	(1.13)	(1.08)	(1.17)	(1.18)	(1.20)
Student	.24	.13	.15	.26	−.10	.10
resources	(.93)	(.88)	(.94)	(1.71)	(.89)	(.91)
Faculty	.10	.08	.13	.16	.13	.08
resources	(.82)	(1.00)	(.93)	(1.12)	(.99)	(.81)
Private	.68	.57	.61	.43	.51	.51
support	(.47)	(.50)	(.49)	(.50)	(.50)	(.50)
University	.42	.42	.47	.57	.51	.49
	(.49)	(.49)	(.50)	(.50)	(.50)	(.50)
East	.35	.34	.34	.27	.33	.32
	(.48)	(.47)	(.47)	(.45)	(.47)	(.47)
Midwest	.27	.30	.31	.24	.30	.31
	(.45)	(.46)	(.46)	(.43)	(.46)	(.46)
South	.20	.18	.19	.26	.18	.18
	(.40)	(.38)	(.39)	(.44)	(.38)	(.38)
Southwest	.08	.08	.07	.12	.08	.10
	(.27)	(.27)	(.25)	(.33)	(.27)	(.30)
West	.06	.05	.05	.07	.05	.04
	(.24)	(.22)	(.21)	(.26)	(.22)	(.20)
Woman	.09	.18	.36	.26	.33	.03
incumbent	(.29)	(.39)	(.48)	(.44)	(.47)	(.17)
Incumbent	.40	.51	.42	.60	.46	.51
hired from	(.49)	(.50)	(.49)	(.49)	(.50)	(.50)
inside						
Tenure of	5.01	5.91	5.16	4.69	5.81	7.60
incumbent	(5.60)	(5.44)	(5.95)	(5.07)	(6.34)	(7.34)
Minority	.04	.05	.03	.15	.08	.04
incumbent	(.19)	(.22)	(.17)	(.36)	(.27)	(.20)
N	340	478	394	97	433	457

[a] Standard deviations are in parentheses.

Table 3 presents a correlation matrix for one of the positions—director of admissions.[4]

Table 4 presents the results of regressions on relative wages for 1978–79. The table also presents summary statistics (R^2 and F) for similar regressions computed for data from the 1983–84 academic year. The 1983 results are essentially the same as the 1978 results; we discuss all differences between

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[4] Additional correlation matrices are available from the authors on request. For each of the six positions used in the analyses, there were no major differences in the pattern of correlations between the independent variables.

TABLE 3

Correlations Between 1978 Variables for the Position of Director of Admissions

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Percent mean salary														
2. Size	-.32													
3. Student resources	.09	.12												
4. Faculty resources	-.10	.39	-.12											
5. Private support	.36	-.39	.27	.01										
6. University	-.34	.52	-.11	.20	-.40									
7. East	.20	-.12	.05	.08	.20	-.23								
8. Midwest	.02	.01	-.00	-.17	.00	.05	-.47							
9. South	-.16	.06	.01	.01	-.18	.07	-.33	-.30						
10. Southwest	-.12	.13	-.08	.10	-.13	.13	-.21	-.20	-.14					
11. West	.01	-.01	-.01	.08	.09	.09	-.17	-.16	-.11	-.07				
12. Woman incumbent	-.18	-.14	.15	-.10	.15	-.19	.04	-.10	.04	.02	.04			
13. Incumbent hired from inside	-.17	.14	.03	.08	-.07	-.00	.04	.00	.01	.01	-.12	.22		
14. Tenure of incumbent	.16	.08	-.04	.06	-.06	.07	.09	-.13	.02	.03	.01	-.10	.09	
15. Minority incumbent	-.08	-.05	-.02	.04	-.19	-.02	-.03	-.11	.12	.04	.03	.12	.10	-.13

TABLE 4
Results of Ordinary Least Squares Regression on Relative Salary[a]

Variables	Chief Development Officer	Director of Admissions	Director of Alumni Affairs	Director of Community Services	Director of Student Placement	Director of Athletics
Size	−.02	−.02*	−.0001	−.07**	−.03***	.02*
	(.02)	(.01)	(.01)	(.03)	(.01)	(.01)
Student resources	.02	.01	.02*	.02	−.01	−.02*
	(.02)	(.01)	(.01)	(.02)	(.01)	(.01)
Faculty resources	.01	−.003	.02*	.01	−.01	−.002
	(.02)	(.01)	(.01)	(.03)	(.01)	(.01)
Private support	.18***	.07***	.03†	−.17**	−.06**	−.04*
	(.04)	(.02)	(.02)	(.06)	(.02)	(.02)
University	−.02	−.07***	−.04*	−.18*	−.07***	−.02
	(.03)	(.02)	(.02)	(.06)	(.02)	(.02)
East	.08	.06†	−.06†	−.16	−.02	−.01
	(.07)	(.03)	(.04)	(.11)	(.03)	(.04)
Midwest	.08	.05	−.03	.05	.01	.02
	(.07)	(.03)	(.04)	(.11)	(.03)	(.04)
South	.04	.03	−.08*	−.08	−.05	.06
	(.07)	(.03)	(.04)	(.11)	(.03)	(.04)
Southwest	.06	.03	−.03	−.12	−.02	−.01
	(.08)	(.04)	(.04)	(.12)	(.04)	(.04)
West	.05	.03	−.04	.02	.02	−.02
	(.09)	(.04)	(.05)	(.14)	(.04)	(.06)
Woman incumbent	−.24***	−.09***	−.10***	−.27***	−.09***	−.09*
	(.04)	(.02)	(.02)	(.05)	(.02)	(.05)
Incumbent hired from inside	−.09	−.03*	.01	.02	.01	−.04**
	(.03)	(.01)	(.01)	(.05)	(.01)	(.02)
Tenure of incumbent	.002	.005***	.01***	.01*	.01***	.01***
	(.002)	(.001)	(.001)	(.005)	(.001)	(.001)
Minority incumbent	−.08	.01	−.03	−.06	.02	−.02
	(.07)	(.03)	(.04)	(.07)	(.02)	(.04)
N	296	418	344	84	383	402
R^2	.29	.29	.24	.42	.28	.14
F (entire equation)	9.59***	13.12***	8.74***	5.29***	11.37***	5.47***
R^{2b}	.27	.33	.12	.18	.26	.13
F^b (entire equation)	11.07***	17.30***	5.15***	2.08**	12.49***	5.67***

[a] Results are based on 1978 data; unstandardized regression coefficients are reported with standard errors in parentheses.

[b] Summary statistics for results for 1983.

† $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

results for the two academic years later in this section. Recall that the dependent variable in Table 4 is the salary of a position's incumbent in a particular institution as a percentage of the mean salary for all administrative positions reported by that institution. Thus, the dependent variable is the relative salary for that particular position in an institutional salary structure.

Table 4 shows that location in a private institution has a positive and significant effect on salaries for the positions of chief development officer, director of admissions, and director of alumni affairs, even after all other personal and institutional variables are statistically controlled. The data indicate that, as expected, incumbents of those three positions earn comparatively more in private institutions, where the positions are more critical and important than they are in public institutions. However, for the 1983 data, the coefficient of the private support variable is negative but insignificant for directors of alumni affairs.

For those positions that are more important in public institutions, the results also provide support for the effect of a position's importance on relative salary. For three positions—director of community services, director of student placement, and athletic director—location in a private institution had the expected negative effect on relative salaries: salaries for those positions are comparatively higher in public institutions. However, for the position of athletic director, the negative coefficient of the private support variable for 1983 is not statistically significant.

The results for the control variables are about as expected. Being a woman is consistently and negatively associated with relative salary, and tenure in a job is consistently, positively associated with relative salary. Since we performed the analyses within positions, analyzing each separately, and controlled for a number of institutional characteristics as well as characteristics of incumbents, the data indicate fairly clearly that sex discrimination depresses salaries in this particular population for the positions studied.

Membership in an ethnic minority group has little consistent effect on relative salary, and being hired from inside is not always negatively associated with relative salary. Institutional characteristics are not consistently associated with relative salary, but that is to be expected. It is not at all clear that size, institutional type (four-year college or university), and institutional resources are systematically related to the comparative importance or criticality of the set of positions. Therefore, the fact that those variables exhibit few systematic relationships with relative salaries simply serves to reinforce the conclusion that the distinction between public and private is an important one for assessing the relative importance of the administrative roles studied. There is little indication that the results for the analysis differentiating public and private support are artifactual. Rather, the fact that type of support has the expected set of effects and that other institutional factors have no systematic effects on relative salary reinforces the idea that type of support affects the importance of a position. For instance, if private universities simply paid more, or less, than other institutions, type of support would yield no significant effect once salary was taken as a proportion of mean

salary, and it would have similar effects across all the positions. Moreover, if the public-private distinction did not really capture institutional differences in resource acquisition contingencies, other institutional factors would produce the same pattern of results as that difference. Neither of those patterns of results holds.

An additional set of analyses further reinforced that conclusion. We replicated the analyses in Table 4, computing relative salary across only the six positions used in the study rather than across the entire set of administrative positions. Also, we included only those institutions that reported having at least three of the six positions in the new analysis, which we undertook to eliminate the possibility that the results reported in Table 4 were the consequence of the number and type of administrative positions that happened to be reported in each institution's administrative structure. It is possible, for instance, that the administrations of public and private institutions differ in composition in terms of other positions not included in our analyses, which also differ in terms of their salary levels. If that were the case, the comparisons reported thus far, computed with respect to the entire set of administrative positions in each institution, might be picking up spurious compositional effects. Comparing the positions only to each other in terms of relative salary across institutions puts the argument to its most stringent test. The additional analysis also examines whether the results are robust across a definition of wage structures that compares wages for a smaller set of positions only to each other. Relative salary was measured as a percentage of the mean salary of the other five positions, not including the position itself, to avoid part-whole correlation problems. Table 5 displays only the results for the public-private variable in the new analysis.

Unfortunately, very few institutions that reported at least three of the six positions also reported having a community services director; in 1978–79 only 28 community service positions met the criteria for inclusion in the restricted group, and in 1983–84 only 16 positions met the criteria. Therefore, Table 5 includes no data for directors of community services. For the positions that are more critical in public institutions—directors of student placement and athletics—the results reported in Table 5 are in the predicted direction and are stronger than the results reported in Table 4. For the positions that are more critical in private institutions, the results are all in the predicted direction, but some are not quite as strong as those reported in Table 4. For admissions and alumni directors, the coefficients are in the predicted positive direction but fail to reach significance.[5]

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[5] One additional test was performed on all equations summarized in Tables 4 and 5. Each equation was estimated without the private support variable, and the increase in R^2 from adding the private support variable was computed. In 11 of the 12 cases in Tables 4 and 5 where the coefficient of private support was significant at the .10 level of probability or better, the increase in R^2 was also significant at the .10 level or better. The only case in which a significant t-statistic for the private support variable was not associated with a significant increase in R^2 was the alumni affairs equation in Table 4.

TABLE 5
Results of Additional Regression Analysis[a]

Positions	Public/Private Coefficient	
	1978	1983
Chief development officer	.272***	.189***
	(.041)	(.033)
Director of admissions	.024	.027
	(.020)	(.021)
Director of alumni affairs	.022	.003
	(.027)	(.023)
Director of student placement	−.136***	−.116***
	(.022)	(.019)
Director of athletics	−.074***	−.067**
	(.022)	(.024)

[a] The dependent variable was the salary for a position divided by the mean salary for other administrative positions in the set. Unstandardized regression coefficients are reported; standard errors are reported in parentheses.

* $p < .05$
** $p < .01$
*** $p < .001$

In general, the pattern of results in Tables 4 and 5 is quite consistent with our a priori predictions about the effect of the different types of resource dependencies confronting public and private institutions. Director of alumni affairs was the only position for which the results did not provide strong support for our predictions; the coefficient of the private support variable was positive and significant in the 1978 analysis on the larger population but otherwise failed to reach significance. However, this one anomalous result is not totally surprising. It is possible that both private and public institutions rely on alumni to provide support: financial support in the case of private universities and political support in the case of public universities. Although the relative importance of those two types of support probably differs, both are important.

DISCUSSION

This study had two purposes, and each was substantially achieved. First, because of the importance of understanding wage structures, or the relationships among wages, and because of the extensive literature on the effects of wage structures on perceptions of injustice, satisfaction, turnover, and other important outcomes, we wanted to find some ways of measuring the relationships between the salaries of positions in an organization. We suggested one measure of the relationships between salaries: the salary of the incumbent of a given position as a percentage of the mean salary of all incumbents of a set of related positions.

More important, we wanted to examine a prediction, derived from several literatures, that the relative compensation paid to incumbents of a

position would be higher in those types of organizations in which the position was important. The empirical results provide reasonable support for this prediction. Using Tolbert's (1985) measure of a position's importance, the frequency of its occurrence in organizations of different types, we identified three positions that were more important in private than in public institutions and three positions that were more important in public than in private institutions. We then found that, even when we controlled for other factors, two of the three positions that were more important in private institutions yielded relatively higher pay in those settings. Also, all three positions that were more important in public institutions brought relatively higher pay in those settings. Moreover, those results generally held across two separate years and across two different ways of measuring relative salaries.

Perhaps in contexts in which positions are especially critical, highly skilled or experienced people are recruited, and higher salaries are needed to attract those more capable individuals. It is important to note that such an interpretation is really not an alternative argument but, instead, provides one plausible mechanism by which the process we describe works. If a position is critical, and its incumbent is consequently paid more than a counterpart in a different type of institution, it is certainly likely that a highly capable applicant can be attracted to the job. For an institution, that is undoubtedly one of the purposes of paying more. However, to say that a person is paid more because she or he is highly capable does not answer the question of why an organization would choose to have a highly skilled individual in the position and, as a consequence, have to pay more. Our analysis suggests that the answer is, in part, the position's criticality in the organization.

At a more general level, it is important to note that the regression equations were able to account for a substantively important amount of the variation in relative wages by using factors such as the characteristics of the incumbents and the institutions and the criticality of the positions. The analysis ignored traditional issues, such as the specific content of the jobs and the skills necessary to do the jobs. Those factors also affect relative wages, but the present data set does not permit us to explore them. However, the fact that individual and institutional factors explain much of the variation in wage relationships indicates that the technical and economic factors that traditional studies of wage structure (e.g., Livernash, 1957) have examined are not the only relevant aspects. In general, our results are consistent with the idea that wage structures, like wages, are not fully determined by market, economic, or technical forces. Future investigators need to take such a perspective seriously in the study of wage relationships in organizational settings.

Extending this type of analysis to other institutional contexts and to other positions is important. We need to move beyond the analysis of the determinants of individual, positional, and organizational salary levels to examine the factors that affect the relationships among wages in organizations. The results of the present study indicate that, in general, such a line of

inquiry can be conducted and can be productive. More specifically, there is evidence that researchers can assess a position's importance independently, without including the consequences of that importance, and that a position's importance or criticality affects its place in an organizational wage structure.

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ORGANIZATIONAL BOUNDARY SPANNING IN INSTITUTIONALIZED ENVIRONMENTS

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Using an institutional framework, this study tested hypotheses concerning the differences in boundary-spanning strategies between freestanding organizations and organizations that are members of multiorganizational systems. We compared the effects of both environmental variables and organizational characteristics, using data from a nationwide sample of 901 hospitals. Results show that membership in a system increases the likelihood of hospitals using bridging strategies. Further, organizational complexity in boundary spanning mirrors complexity in an institutional environment in a complex, not simply isomorphic, manner.

How spatial or corporate units are defined has important implications for developing and testing hypotheses about organizational behaviors focused on the boundaries of such units. Boundary-spanning activities (Thompson, 1967) can either link organizations to other organizations or buffer them from environmental disturbances. Use of either strategy, however, assumes that where one organization ends and another starts, or what is inside of one organization's boundaries and what is outside, is reasonably clear. Freeman (1978) noted that changes in organizations both over time and through space complicate the problem of defining organizational boundaries. Over time, organizations will perhaps grow, merge with other organizations, acquire subsidiaries, or change goals and identities completely. Thus, defining the same organization at two different times can be difficult. Alternatively, at any one time an organization can occupy different spatial configurations. Given the problem of hierarchical clustering, or multiple levels of organization (Freeman, 1978), organizations can be defined as either independent units or members of larger organizational systems. Moreover, whether an organization is completely freestanding or is embedded in a multiorganizational system may influence its use of boundary-spanning strategies.

In this study we were concerned with explaining differences in how organizations that are freestanding and those that are members of larger systems use boundary-spanning strategies. Theoretically, the incorporation of an organization into a system redefines its environmental boundaries. The external boundary of an organization joining a system becomes the system's boundary, not that individual organization's immediate boundary. The external environment is more remote and perhaps less threatening for organizations that belong to systems than for freestanding ones. At the same time, however, a new internal boundary—a corporate identity—becomes salient.

We are also interested in how environmental characteristics can influence organizational choices of various boundary-spanning strategies. Taking an open-systems perspective (Buckley, 1967; Pfeffer & Salancik, 1978; Thompson, 1967), we viewed organizations as both influenced by environmental constraints and capable of adapting to environmental changes. As Cook and her colleagues (Cook, Shortell, Conrad, & Morrisey, 1983) argued, those adaptations occur through both modifications in internal structural arrangements and the establishment of various interorganizational arrangements. How an environment affects the choice between making internal structural changes, or buffering, and external connections, or bridging, may differ for freestanding and system-member organizations, however.

THEORETICAL BACKGROUND

Environmental constraints can be either technical or institutional. According to Meyer and Scott (1983), environments impose technical constraints relating to the production and exchange of a good or service in a market. By adapting to technical environmental pressures, organizations reap rewards for their effective control and coordination of work processes and for buffering their technical cores from environmental disturbances (Alexander & Scott, 1984). Institutional constraints are the often elaborate sets of rules and requirements that organizations' social, legal, and political contexts impose upon them. Government regulations and the normative expectations of powerful professional groups and of other organizations and interest groups are examples. Conforming to institutional constraints results in the societal support and legitimacy needed to ensure survival (DiMaggio & Powell, 1983; Fennell, 1980; Zucker, 1977, 1983). Rather than rewarding efficiency and effectiveness in production, institutional environments encourage conformity to powerful institutional rules, myths, and structures. Some of those rules and myths may lead organizations to adopt technologies or management structures more for their symbolic value than for any clearly demonstrable increase in technical efficiency. For example, in public-sector organizations an emphasis on cost accounting, the use of certified professionals, or the preponderance of elaborate information-processing technologies (Meyer & Rowan, 1977; Rowan, 1982) may have no effect on productivity, or even a negative effect, but they all serve to signal other organizations and the public that the organizations in question is rational, modern, or doing all that it can (Perrow, 1979; Pfeffer, 1981).

Alexander and Scott (1984) argued that the environments of all organizations in modern industrial societies are to some degree institutionalized. For example, nearly all organizations are subject to health and safety regulations, equal employment opportunity requirements, local fire codes, and various record-keeping requirements for tax purposes. However, variation occurs in the extent to which organizational environments are highly demanding in either the technical or institutional arenas. Moreover, some organizations are located in environments characterized by both high technical and high institutional development; banks, defense contractors, and hospitals are examples (Alexander & Scott, 1984; Scott, 1982).

Hospitals provide a particularly useful opportunity to compare free-standing organizations with those that are members of systems, given the recent trend toward consolidation of independent hospitals into multihospital systems (American Hospital Association, 1985; Fottler, Shemerhorn, Wang, & Money, 1982). We define a multihospital system as two or more hospitals that are owned, leased, sponsored, or managed by a single corporate entity. The rapid development of multihospital systems may be related to the hospital industry's recent experience with an increasingly complex regulatory and fiscal environment. Health care is considered one of the most heavily regulated sectors in the U.S. economy. At the same time, however, technical constraints are considerable because innovations in medical treatment and techniques continue to develop rapidly, and emphasis on cost control and efficiency is growing.

Our hypotheses predict how institutional pressures may affect an organization's choice of boundary-spanning strategies, with freestanding hospitals and hospitals in multihospital systems as the focuses of comparison. Our underlying thesis, however, applies to all organizations confronted by highly developed institutional environments. In brief, we suggest that organizations tend to map into their own structures the complexity of the environments they face (DiMaggio & Powell, 1983; Meyer & Scott, 1983; Thompson, 1967). Boundary-spanning activity, then, should mirror or match environmental constraints.

We use the term *boundary-spanning activity* to refer to three different types of organizational behaviors: boundary redefinition, as when a hospital joins a multihospital system; buffering, or protecting an organization against disturbing environmental influences; and bridging, or connecting an organization to other organizations. Each of those behaviors represents a possible strategy for adapting to environmental disturbances by managing organizational boundaries.

Hospitals are unusual in that they have historically had to deal with regulatory programs head-on, without the benefit of having an intermediate administrative level like a county or district office to serve as a buffer. Some researchers have argued that the recent proliferation of multihospital systems may represent an attempt on the part of beleaguered freestanding hospitals to create such buffers—centralized administrative units to ease their individual burdens (Meyer & Scott, 1983). Thus, for organizations like hospi-

tals that face demanding insititutional environments, boundary redefinition may appear to be a viable boundary-spanning strategy.

In addition to boundary redefinition, hospitals can choose two direct buffering strategies. They can augment or increase internal administrative structures and positions, since environmental pressures are often dealt with either directly or indirectly at an administrative level (Pfeffer & Salancik, 1978; Thompson, 1967). For example, additional regulatory requirements may result in a managerial decision to add data processing employees to extract and manage the data needed to file required reports. Or a hospital might add or enlarge its legal department as a means of coping with a complex regulatory environment. Multihospital systems can centralize such expensive personnel at their headquarters for use by all member institutions, which need not then individually add administrative capacity.

An alternative buffering strategy is to augment peripheral structures that deal directly with boundary management and interfacing with environments. Some industries create special buffer organizations, such as the cigarette industry's Tobacco Institute (Dunbar & Wasilewski, 1985; Miles & Cameron, 1982). For hospitals, governing boards act as important environmental buffers. Increasing either the size of a board or the extent to which it represents a community have been cited as effective boundary-spanning strategies (Pfeffer, 1973; Pfeffer & Salancik, 1978).

Bridging strategies represent a completely different approach to boundary management because they involve creating linkages to other organizations rather than developing internal structural buffers (Pfeffer & Salancik, 1978). External linkages usually imply some loss of organizational autonomy. Two areas that are likely to be involved when hospitals establish external links are clinical and nonclinical services. Rather than establish a service in-house, a hospital can contract with external organizations—another hospital or a service agency—to provide clinical services like radiation therapy or computerized axial tomographic scanning. Hospitals can also contract for the provision of nonclinical services like data processing or laundry.

HYPOTHESES

Boundary Redefinition

Figure 1 summarizes the hypotheses tested in this study. They focused on the influence of institutional pressures on an organization's choice of boundary-spanning strategies. Since we examined only one type of organization, community general hospitals, the technical environment was essentially held constant.

We expected system membership to be more likely where the regulatory environment facing hospitals is more burdensome. Heavily regulated environments can affect the extent to which freestanding hospitals either seek the protection of system status or are at risk of takeover, since the political and legal resources of large systems can more readily deal with the rules and regulations of diverse government agencies (Alexander, Lewis, & Morrissey,

FIGURE 1
Summary of Hypotheses
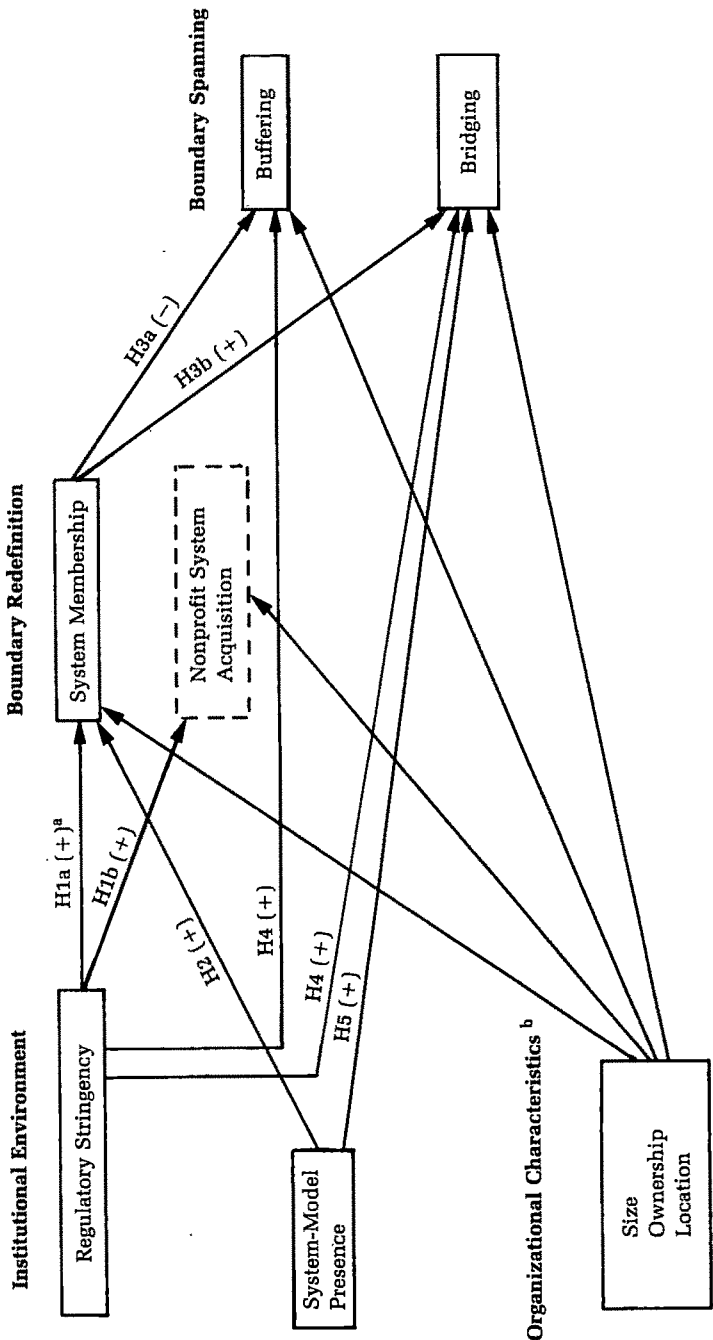
[a] H1 – H5 designate the five major hypotheses tested. The + or – signs in parentheses indicate the direction of the hypothesized relationships.
[b] Organizational characteristics were included as control variables in all equations.

1985). According to Cook and her coauthors (1983), hospital regulations can be thought of as a form of tax on hospitals' behavior; the more stringent a regulatory environment—the more restrictive or constraining it is—the larger the tax. In general, we assumed that the greater resources of multihospital systems enable them to deal with regulatory costs better than most freestanding hospitals can. Following Alexander and Scott (1984), we expected that a hospital is more likely to join a system where that tax is high (Hypothesis 1a).

However, a given regulatory environment affects different types of hospitals and multihospital systems differently. Some investigators have argued that government-controlled hospitals are the most highly exposed to institutional demands, since they must deal with public and political controls over and above the external regulatory controls all hospitals face (Alexander & Scott, 1984). In contrast, for-profit hospitals are somewhat further removed from the public sector and thus somewhat freer to concentrate on the technical demands of efficient production and profitability. For-profit hospitals do not have to cope with civil service systems, elected county officials, and taxing authorities—all of whom represent different political constituencies with different goals and agendas for an organization.

The acquisition strategies of multihospital systems probably reflect such differences in control. Alexander and his coworkers reported that all systems carefully analyze market conditions before acquiring or merging with a hospital (Alexander et al., 1985). Assessing market viability includes considering a variety of demographic, utilization, and supply indicators as well as an area's regulatory, legislative, and business climates. In general, a stringent regulatory environment makes for an unfavorable market climate. State certificate-of-need (CON) legislation in particular has limited the ability of many for-profit firms to enter new hospital markets (McCarthy & Kass, 1983). CON regulations require hospitals to obtain certification from a regulatory agency, usually the state in which they are located, before expanding services or investing in major capital improvements. The certification attests to the need for such expansion or improvement within a community. Failure to seek such certification can result in legal or fiscal sanctions. Entering such regulated markets may be difficult, especially if an expansion or improvement of a facility also requires capital investment.

Nonprofit systems will, however, occasionally "look beyond market conditions if the provision of care in a particular community [is] deemed essential to the system's mission" (Alexander et al., 1985: 7). For example, hospital systems belonging to a religious denomination may have the goal of preserving or maintaining a health-care delivery system for the religion's adherents in a community, even if market and regulatory conditions are unfavorable. Thus, in stringently regulated environments, nonprofit systems are more likely to acquire hospitals than are for-profit systems (Hypothesis 1b).

The extent to which the multihospital system model operates in a region or a state might also affect system membership. DiMaggio and Powell (1983)

suggested that "mimetic isomorphism" occurs when organizations face high levels of uncertainty owing to unclear technologies, ambiguous goals, or complex institutional requirements. That is, when uncertainty abounds, organizations model themselves after successful organizations performing similar functions. For example, in the early 1980s many U.S. industries tried to copy Japanese management models in an almost frantic attempt to increase productivity, regardless of the possible interference of cultural differences.

In the hospital industry, the multihospital system model provides a potential remedy to hospitals caught in a turbulent and uncertain environment. Although the validity of claims that such systems are more cost-effective or efficient than freestanding hospitals (Ermann & Gabel, 1984) has not been empirically established, there have been so many such claims in the hospital industry (Brown & McCool, 1980; Zuckerman, 1979) that it is often assumed that systems have greater success than freestanding hospitals in the currently uncertain hospital environment. Many in the industry may see system membership as the answer to a multitude of problems, which may trigger a mimetic response. Thus, we expected hospitals to be more likely to join multihospital systems in areas where multihospital systems already operate or provide a ready model for emulation (Hypothesis 2).

Buffering and Bridging

As an independent variable, system membership should itself influence the ways in which hospitals interact with their environments. We have described four different kinds of boundary-spanning activity engaged in by hospitals: two buffering strategies, augmenting administrative structures and augmenting boundary-spanning units, and two bridging strategies, establishing external linkages in either clinical or nonclinical areas. We expected system headquarters to assume much of the boundary-spanning responsibility for member hospitals. In a sense, system status itself buffers individual hospitals from their environments, so that additional hospital efforts to buffer become less necessary (Hypothesis 3a). Conversely, decisions by system headquarters to centralize various functions within a system may in fact lead to more bridging activity (Hypothesis 3b). For example, consolidating maternity services in one hospital and oncology programs in another would encourage the development of patient transferral mechanisms and referral services between normally independent hospitals.

Regardless of system status, institutional environments may also affect hospitals' choice of boundary-spanning strategies. Using the concept of isomorphism, we expected complexity in institutional environments to be mirrored or matched by complexity in organizations. When regulations facing organizations are stringent—highly restrictive or constraining (Cook et al., 1983)—environmental complexity increases. Following Alexander and Scott (1984), we expected high levels of regulatory stringency to be associated with increased administrative complexity in hospitals, involving the development of both internal buffers like administrative units, special personnel, and larger hospital boards, and external linkages (Hypothesis 4).

Similarly, the mimetic, or modeling, influence of multihospital systems should affect boundary-spanning activity in hospitals. However, the presence of system models in an area is not likely to affect both buffering and bridging strategies in the same way. In areas where viable system models operate, we expected to see a high level of bridging, since a linking strategy reflects system membership (Hypothesis 5). The presence of the system model would not, however, necessarily stimulate buffering.

Finally, we acknowledged that different types of hospitals have different likelihoods of engaging in boundary-spanning activity, regardless of system status. Size, ownership, and location should be considered when comparing system-member and freestanding hospitals. Large organizations are more likely to have sufficient slack resources to manage boundary spanning and to establish formally specified boundary-spanning units that can then be embedded in an organization's structure and monitored by its managers. For the same reasons, large hospitals are less likely to engage in bridging strategies, since the possible loss of control over such arrangements would represent an unnecessary and unacceptable cost.

We also expect hospitals in the public sector—primarily voluntary non-profits—to engage in more boundary-spanning activity than for-profit hospitals, since such institutions are more dependent on external agencies and powerful constituencies in their environments for moral, legal, and political support (Alexander & Scott, 1984; Meyer & Rowan, 1977). In contrast, for-profit hospitals are more concerned with buffering their technological cores from outside influences and running cost-effective businesses. Lastly, there may be regional variations in the extent to which hospitals are inclined toward buffering or bridging. For example, shared administrative services are historically somewhat more common in the West and in mountain regions (Alexander, 1984) than elsewhere.

METHODS AND DATA

Sample

Our exploratory analysis of the hypotheses used data from a variety of sources. Of central importance as the data source for several of our dependent variables is the Special Survey of Hospital Administrative Environment and Structure (HAES survey) conducted by the American Hospital Association in 1982.[1] This survey was designed in collaboration with researchers at Stanford University. In addition, we used data from the 1982 Annual Survey of Hospitals (American Hospital Association, 1982), Bice and Urban's (1982) report on state regulatory activity, and two American Hospital Association Validation Surveys of Multihospital Systems (American Hospital Association, 1979, 1983). All of the AHA surveys and this study employed individual hospitals as their units of analysis; the Bice and Urban (1982) study used states as units of analysis.

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[1] The HAES survey has not been published or previously analyzed.

The HAES survey targeted a national sample of 1,411 acute care, community hospitals. A proportional random sampling technique was employed in order to achieve a cell design balanced by states. Assuming a 65 percent return rate, the survey's designers designated sampling fractions in each state that would yield at least 20 representative hospitals per state, except in those states where fewer than 20 hospitals operated, in which case the sampling fraction was 1.0. For the five states with the largest hospital populations, number of beds defined a second sampling stratum.[2]

The American Hospital Association fielded the HAES survey in three waves. The first mailing to 1,411 hospitals yielded a 42 percent response rate, and second and third mailings increased the response rate to 64 percent; a total of 901 hospitals returned the survey. We compared responding and nonresponding hospitals in terms of both size and ownership. On size, measured as number of beds, there appeared to be no significant difference between responders and nonresponders, although responding hospitals were slightly overrepresented in the large categories and underrepresented in the small categories, compared to nonrespondents. On ownership, responders were proportionally higher in the nonprofit category and lower among the for-profit institutions.[3]

Measures

Dependent variables. We used three sets of dependent variables: (1) dummy variables indicating system membership and type of system, (2) three indicators of various buffering strategies, and (3) three indicators of various bridging strategies. All dependent variables were measured using 1982 data. The Appendix summarizes all sources of data, variables, and measures used.

System membership was measured using items from the 1983 American Hospital Association Validation Survey of Multihospital Systems, which reports 1982 data. We used one dummy variable to indicate whether a hospital was a member of a multihospital system or not, with 1 = member, and constructed four other dummies to indicate whether a hospital was a member of a public, government-controlled system, a secular, nonprofit system, a religiously affiliated system, or a for-profit system.

Buffering strategies were conceptualized and measured as strategies that protect the core technology of an organization by increasing the cushion or buffer between it and its environment (Thompson, 1967). Hospitals can build buffers at either the administrative or institutional level—that is, either by increasing the size of their administrative component or by increasing the size of certain boundary-spanning units. Hospitals can buffer themselves from external uncertainty by increasing numbers of administrators, such as managers and supervisors, or by increasing the size of their boards of trustees (Pfeffer, 1973; Pfeffer & Salancik, 1978; Scott, 1981). An additional strat-

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[2] We will provide details of the sampling design on request.
[3] Details of the analysis are available on request.

egy may be increasing the number of community representatives on a board, thereby allowing a hospital to co-opt segments of a community. To capture each of those three different buffering strategies, we used three measures from the HAES survey: (1) the ratio of the number of administrative employees to the total number of full-time employees, (2) the size of the governing board, and (3) the proportion of the board consisting of nonmedical and nonhospital-related individuals.

Bridging strategies represent ways in which an organization constructs links to various actors in its environment. An important type of linkage for hospitals is the provision of various hospital services in cooperation with other hospitals or organizations in an area. Two of our bridging measures focused on external service linkages: the proportion of clinical services that were provided externally and the proportion of nonclinical services provided externally. In addition, hospitals may choose to cooperate in various planning groups or consortia; a third measure, focusing on whether or not a hospital is a member of a central planning group for area hospitals, became a dummy variable, with 1 = yes. The measures came from the 1982 American Hospital Association Annual Survey of Hospitals and the 1982 HAES survey.

Independent and control variables. Our independent variables focused on hospitals' environments, and our control variables focused on organizational characteristics. We investigated two aspects of hospitals' environments: the level of regulatory stringency in 1978 and the degree to which multihospital systems constituted an important presence or organizational model in an area in 1979.

Regulatory stringency, considered an important aspect of the institutional environment of hospitals, refers to the restrictiveness of regulation. Our measure of regulatory stringency consisted of seven indicators and covered two of the most common types of hospital regulatory programs operating at the state level in 1978—rate review and certificate-of-need (CON) regulation (Bice & Urban, 1982). Both programs vary considerably across states in procedures, orientation, and frequency of review. The Appendix contains details on the specific indicators and construction of the index of regulatory stringency that we used.

Our interest in mimetic pressures, or organizational modeling (DiMaggio & Powell, 1983), can only be indirectly examined, by considering the extent to which multihospital systems operated in a region before the HAES Survey. We developed our indicator from the 1979 American Hospital Association Validation Survey of Multihospital Systems. The proportion of all community hospital beds in the state controlled by multihospital systems in 1979 should provide an approximate measure of prior system-model presence.

Two organizational characteristics used as control variables were measured with items from the 1982 AHA annual survey: hospital size (number of beds) and type of ownership. We collapsed the four standard ownership categories—for-profit, religious, government-controlled, and secular, nonprofit— into three dummy variables, using the category of secular, nonprofit

as the comparison category for each. Finally, we created three dummy variables for region of the country, employing East, West, and South as categories, with North as the comparison category.

Analysis

Hypotheses were tested by multiple regression analysis. In addition, for the categorical dependent variables we also performed multiple logistic regression, which does not require the assumption of homoscedasticity. Results of the logistic regressions were quite comparable with those of the ordinary-least-squares regressions, indicating fairly robust results. For the sake of simplicity, however, we only present results of the ordinary-least-squares regressions.

Although the hypotheses depicted in Figure 1 imply causal relationships among our variables, we did not have the longitudinal data needed to assess causality. We did obtain lagged measures of institutional environments, which helped in our analysis of environmental effects on boundary spanning. Nonetheless, without complete longitudinal data, the analyses presented here must be considered exploratory.

Table 1 contains the means, standard deviations, and zero-order correlations among all variables. Location in the East seems to be negatively correlated with system-model presence ($r = -.68$). Thus, regressions containing those two collinear variables should be interpreted carefully. Further, an analysis of skewness of the dependent variables revealed a moderate level of skewness in the ratio of administrative to total employees. To normalize the distribution, we used the natural log of that ratio in subsequent analyses.

As might be expected, the correlation between total number of full-time employees, the denominator for our measure of buffering at the administrative level, and total number of beds was quite high ($r = .91$). In fact, number of beds and number of staff members are both frequently used as measures of hospital size (Kimberly, 1976; Fennell, 1980). Thus, interpretation of a regression model that included both total number of staff members in the denominator of the dependent variable and number of beds as a regressor would be prone to spuriousness, as discussed by Schuessler (1973). To avoid that problem, we removed hospital size from the regression model for the ratio of administrative to total employees. Since the ratio inherently controls for size, its use as the dependent variable automatically removes part of the effect of size from the equation.[4] Further, the ratio measure more accurately reflects the concept of administrative buffering as augmentation of administrative level in relation to a total organization.

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[4] A regression of logged administrative ratio in which hospital size was included resulted in a much higher adjusted r-square (.28), but all coefficients were nonsignificant except for hospital size ($b = -.49, p = .001$) and location in the South ($b = -.14, p = .001$). Further analyses of the different types of administrative workers included in the numerator of the ratio variable (managers, business, accounting, and data processing employees, clerks and typists, and experts and specialists) revealed that increased regulatory stringency is negatively associated with all types of specialized administrative employees except managers.

TABLE 1
Means, Standard Deviations, and Zero-Order Correlations[a,b]

Variables	Means	Standard Deviations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Dependent																					
1. System member[c]	0.25	0.43																			
2. Public system[c]	0.01	0.08	14																		
3. Secular, nonprofit system[c]	0.05	0.22	37	−02																	
4. Religious system[c]	0.11	0.31	39	−03	−08																
5. For-profit system[c]	0.04	0.20	34	−02	−05	−07															
6. Administrative ratio	0.17	0.13	−03	03	−03	−07	−11														
7. Board size	13.76	10.39	−05	−05	05	−03	−07	−23													
8. Percent nonmedical board members	0.78	0.19	−17	05	07	−16	−40	13	10												
9. Percent clinical services external	0.20	0.18	11	10	06	01	06	17	−14	00											
10. Member of area planning group[c]	0.29	0.45	04	−02	04	01	−02	−04	12	−02	00										
11. Percent nonclinical services external	0.41	0.19	21	06	12	−02	15	08	−02	−03	06	07									
Independent																					
12. Regulatory stringency	3.62	2.25	−06	−06	−05	05	−05	−10	22	00	−07	10	04								
13. System-model presence	0.04	0.01	19	01	13	11	09	06	−26	−09	08	−09	20	00							
14. Hospital size	173.07	163.08	08	01	06	15	−03	−50	39	−07	−28	07	−14	12	−08						
15. East[c]	0.15	0.36	−16	−03	−09	−08	−07	−11	39	06	−03	21	−08	30	−68	12					
16. West[c]	0.25	0.43	11	01	14	00	03	12	−16	−03	04	03	21	−02	41	−15	−24				
17. South[c]	0.32	0.46	−01	06	−05	−02	15	−12	−07	−11	00	−16	−06	−20	00	05	−29	−40			
18. For-profit hospital[c]	0.06	0.25	26	−02	−06	−08	76	02	−13	−47	05	−05	12	−06	09	−07	−10	04	13		
19. Religious hospital[c]	0.14	0.34	27	−03	−06	70	−09	09	00	−15	−03	00	−10	06	11	19	−05	00	−03	−10	
20. Government hospital[c]	0.30	0.46	−20	03	−10	−22	−13	12	−40	24	03	−07	01	−13	13	−17	−21	09	12	−17	−26

[a] n = 901.
[b] Correlations > |.07| are significant at the .05 level; decimals points are omitted.
[c] Dummy variable with 0 = no, 1 = yes.

RESULTS

System Membership

Table 2 presents results of analyses on system membership. Column 1 presents the regression results for system membership generally, and columns 2 through 5 present results for membership in each type of system. Since the results were quite comparable to those of logistic regression analyses of the same variables, we can take the regression coefficients to roughly represent increases or decreases in the likelihood of hospitals' membership in a multihospital system in 1982, given prior values of the independent variables.

Hypothesis 1, pertaining to the association between regulatory stringency in 1978 and system membership in 1982, was not supported. Increased regulatory stringency is negatively associated with membership in a multihospital system. Analysis of Hypothesis 1a also resulted in findings contrary to our original prediction (see columns 2, 3, and 4). The more stringent the regulatory environment in 1978, the less likely hospitals were to join or to be acquired by nonprofit systems.

Hypothesis 2 received support. In general, a strong system-model presence in 1979, measured as a high proportion of multihospital system beds in an area, was associated with hospitals' propensity to join systems by 1982. It should be noted, however, that most of that relationship seems specific to secular, nonprofit system membership. No significant coefficients emerged for membership in public, religious, or for-profit systems.

TABLE 2
Results of Regression Analyses of System Membership[a]

Independent Variables	System Member	Type of System			
		Public	Religious	Secular Nonprofit	For-Profit
Regulatory stringency	-.08*	-.06	.00	-.07*	-.02
System-model presence	.12*	.02	.03	.13**	.05
Hospital size	.07*	.02	.03	.08*	.03
East	-.04	.02	-.05	-.04	.05
West	.05	.04	-.01	.10**	.03**
South	-.02	.08	-.01	.00	.07**
For-profit hospital	.26***	-.04	-.02	-.13**	.76**
Religious hospital	.24***	-.03	.67***	-.16***	-.01
Government hospital	-.13***	.00	-.05	-.22***	-.01
Adjusted R^2	.21	.01	.49	.08	.60
F	26.16***	1.11	93.78***	9.54***	147.59***

[a] $n = 901$; coefficients are standardized regression coefficients.
* $p < .05$
** $p < .01$
*** $p < .001$

Among the control variables, size and ownership of a hospital also have
a bearing on system membership. The larger the hospital, the more likely it is
to be a system member, but once again, that relationship occurred primarily
in the nonprofit sector. Column 1 of Table 2 suggests that for-profit and
religious hospitals are more likely to join systems than secular, nonprofit
hospitals and that local government hospitals are relatively less likely to join
systems than those hospitals. Finally, ownership is associated with the type
of system a hospital joins: for-profit hospitals tend to join for-profit systems,
and hospitals owned by religious groups tend to join religious systems.

Nonetheless, prior hospital ownership and system ownership are not
identical, as an analysis of the ownership categories of all hospitals acquired
by multihospital systems during the eight years before the fielding of the
HAES survey shows.[5] Although at least half of all hospitals acquired by
systems are from the same ownership category, there was considerable cross-
category acquisition. For example, for-profit systems acquired a large propor-
tion of their hospitals from the nonprofit and public sectors (34%), and
secular nonprofit systems acquired many hospitals once owned by religious
groups (21%). Religious systems tended to concentrate on religious hospitals,
but they also acquired a small percentage of other types of hospitals (11%).

Buffering and Bridging

Table 3 presents results related to the type of boundary-spanning activi-
ties practiced by hospitals. Consistent with our prediction in Hypothesis 3,
multihospital system membership is significantly associated with bridging
activity and unassociated with buffering activity. For all three measures of
bridging, multihospital system membership exhibited positive and signifi-
cant coefficients. However, no significant associations of system member-
ship with the buffering variables emerged.

As in the analysis of multihospital system membership, the results con-
cerning regulatory stringency did not support our hypotheses. Hypothesis 4
stated that hospitals operating in extensively regulated environments would
be more likely to use both buffering and bridging strategies than hospitals
operating in less stringent regulatory environments. Increase in the size of a
hospital's board is the only boundary-spanning activity for which the predic-
tion is supported: the more stringent a regulatory environment, the larger a
hospital's board. Contrary to our hypothesis, increased regulatory stringency
is associated with a lower administrative ratio and a smaller proportion of
clinical services provided by external sources.

Hypothesis 5 proposed a positive relationship between the presence of
the multihospital system model in a state and later bridging activities by a
hospital. Results generally supported that hypothesis. Two of the three bridg-
ing variables were positively and significantly associated with the 1979

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[5] Ownership data from the AHA annual surveys for 1976 through 1983 and the AHA's
hospital membership file were used to cross-tabulate hospital ownership with system member-
ship. Complete data from the analysis are available upon request from the authors.

TABLE 3
Results of Regression Analyses Comparing
Buffering and Bridging Strategies of Freestanding Hospitals and System Members[a]

Independent Variables	Buffering Strategies				Bridging Strategies	
	Logged Administrative Ratio	Size of Board	Percent Nonmedical Board Members	Percent External Clinical Services	Member of Central Planning Group	Percent External Nonclinical Services
Regulatory stringency	-.07*	.08**	.01	-.08*	.02	.06
System-model presence	-.06	.04	-.08	.16**	.06	.18**
System member	-.05	-.05	.04	.13**	.09*	.23***
Hospital size	—	.31***	-.04	-.30***	.05	-.09**
East	-.17***	.26***	-.05	.14**	.25***	.10
West	.02	.00	-.05	-.06	.05	.13**
South	-.19***	.04	-.12***	.02	-.07	.03
For-profit hospital	.04	-.14***	-.44***	.00	-.05	.05
Religious hospital	-.06	-.14***	-.15***	-.02	-.04	-.15***
Government hospital	.08*	-.37***	.14***	.00	-.01	-.01
Adjusted R^2	.07	.41	.27	.11	.08	.14
F	7.02***	56.04***	30.02***	10.33***	7.34***	13.67***

[a] $n = 901$; coefficients are standardized regression coefficients.

* $p < .05$
** $p < .01$
*** $p < .001$

system-model presence in a state—the percentage of clinical services externally provided and the percentage of nonclinical services externally provided. Also supporting our hypothesis was the lack of any significant association between system-model presence and the three buffering variables.

Our findings also generally supported a relationship between size and boundary spanning. Large hospitals are significantly more likely to buffer through large governing boards. They are also significantly less likely to bridge in either the clinical or nonclinical arenas. Finally, we also expected for-profit hospitals to be less likely than secular, nonprofit institutions to engage in any type of boundary-spanning activities. The negative and significant coefficients for two of the buffering variables, board size and proportion of nonmedical board members, tend to confirm that prediction. However, no significant differences between for-profit and nonprofit hospitals were found for any of the other buffering or bridging dependent variables.

DISCUSSION AND SUMMARY

These exploratory results are important for several reasons. First of all, they show a clear distinction between system members and freestanding organizations in their propensity to adopt bridging strategies. Hospitals in systems are significantly more likely to bridge, probably as a result of corporate policies intended to centralize functions and minimize costs. Further, bridging strategies are more likely to be found in states where the presence of a multihospital system model is significant. Left unanswered, however, is the question, with whom are those bridges built? Bridging to other system members is one obvious alternative, but in some respects it represents a much easier type of linkage to build and maintain than does bridging to organizations outside of a multihospital system. Future research needs to distinguish between within-system bridges and other external linkages.

Second, we found some support for the claim that institutional constraints affect organizational selection of boundary-spanning strategies. However, the two types of institutional forces examined here, regulatory or coercive pressure and mimetic or modeling pressure, do not exert similar effects. As hypothesized, a hospital's propensity to join a multihospital system appears higher in states where the system model is strong. Further, that relationship seems specific to secular, nonprofit systems. The preexistence of a system model in a state significantly increases the likelihood of membership in nonprofit systems. Perhaps that type of institutional constraint does not affect all types of hospitals and systems in the same way. The voluntary, nonprofit sector is probably more susceptible to felt pressure to model or conform to popular organizational models in its environment. Other sectors, such as government hospitals, for-profit systems, and systems owned by religious groups, have environmental niches that are determined primarily by their ownership. The results reported here seem to support the notion that the hospital industry is highly fragmented. Hospitals have no uniform, predictable response to various environmental pressures; different segments of the industry are more or less influenced by different types of pressure.

We also hypothesized that increased regulatory stringency would contribute to the likelihood of hospitals' joining systems and correlate with their use of both buffering and bridging strategies. Neither of those hypotheses received support. In fact, hospitals were significantly less likely to join multihospital systems in such environments. Also contrary to our hypothesis, hospitals in stringently regulated environments were less likely either to buffer by adding administrative personnel or to establish clinical bridges to other organizations.

The significance of those unexpected findings calls into question the pervasive view of hospital regulatory programs as pushing hospitals toward increased complexity or toward a greater reliance on other organizations. We found no evidence for the image of a multihospital system as a protective umbrella against the storm of regulatory pressure. Rather, redefining hospitals' boundaries seems to be explained primarily by predisposing organizational characteristics, such as size and ownership, and perhaps also by a significant system-model presence in a state. System membership is, then, an important factor in a hospital's selection of bridging over buffering.

The results reported do suggest, however, that hospitals seem to develop more complex boundary-spanning strategies than we had originally anticipated when they face a stringent regulatory environment. Rather than increasing structural complexity at all levels, hospitals may respond to increased regulatory stringency by selectively increasing the size of specific boundary-spanning units, such as governing boards, and decreasing the size of administrative buffers, such as specialized staffs like data processing and business employees. Applying Thompson's (1967) classic model, we suggest that hospitals may be more likely to bear the costs of regulatory pressure by retrenchment at the administrative level rather than at the institutional or technical-core levels, even though many hospital regulatory programs, such as certificate-of-need programs, focus specifically on reducing excess technological capacity.

The results reported here represent a departure from results reported for other types of human service organizations. Earlier work by Freeman and Hannan (1975) on school districts showed that in periods of decline school districts do not lose support staff members at the same rate at which they were added during periods of growth. In some types of human service organizations, inertia effectively maintains the size of an administrative component; but in hospitals, numbers of support staff members may decline when environments become more complex. However, Freeman and Hannan analyzed differential equations for change in rates of growth or decline, and our results are based only on one cross-section of lagged data. Thus, a direct comparison is not appropriate, although it is certainly substantively suggestive.

Protection of the technical core may also explain why hospitals are less likely to join multihospital systems in intensely regulated environments and why clinical service bridges to other organizations are less likely. Both of those strategies can require radical restructuring of a technical core, through

rearrangement or specialization of patient treatment within a system, or through patient transfers and shared service arrangements between nonsystem hospitals. Rather than give up control of a clinical service when faced with a stringent regulatory environment, hospitals may be more willing to sacrifice layers of administrative buffering.

Clearly, governing boards are still an important boundary-spanning unit within hospitals, and they appear to grow as an institutional environment becomes more complex. The more stringent a regulatory environment, the more need for effective integration and linkage with it—thus, the larger a governing board (Pfeffer, 1972). That relationship holds true regardless of hospital size. Large boards afford hospitals, and other organizations, more opportunities for linkage to their environments through the appointment of important individuals in both medical and nonmedical arenas. Also, linkages to other important organizations like financial, consumer, professional, and regulatory groups become possible through board interlocks (Burt, 1980; Pennings, 1980; Umbdenstock, 1979). The extent to which an institutional environment affects the development and nature of board interlocks is an area that clearly deserves further study.

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APPENDIX

Boundary redefinition. All items were dummy variables with 0 = no, 1 = yes, based on 1982 data from the American Hospital Association Validation Survey of Multihospital Systems (American Hospital Association, 1983). System membership: hospital is a member of a public; secular, nonprofit; religious; or for-profit multihospital system.

Buffering strategies. Three separate measures were used, based on data from the 1982 HAES survey: (1) logged ratio of administrative, managerial, and supervisory staff members to total hospital personnel, (2) the total number of a hospital's governing board members, and (3) the ratio of nonmedical governing board members to total governing board members.

Bridging strategies. Three separate measures were used: (1) the ratio, in 1982, of the number of clinical services provided by external organizations to the total number of clinical services provided, based on data from the AHA annual survey (American Hospital Association, 1982); (2) whether a hospital participated in a central planning group for area hospitals, a dummy variable based on data from the 1982 HAES survey; and (3) the ratio of the number of administrative services provided by external organizations to the total number of administrative services provided by the hospital, based on data from the 1982 HAES survey.

Regulatory stringency. Measures were based on data collected in 1978 by Bice and Urban (1982). Stringency of rate review included four indicators: (1) number of rate-setting methods employed in a rate-review program, such as the number of formulae, cost screens, and peer group comparisons: (2) reimbursement on the basis of a per diem rate, or on the basis of a total budget; (3) use of a formal appeals process in a rate-review program; and (4) the frequency of hospital rate reviews, whether quarterly, annually, at time of rate change, or only at a hospital's request. Stringency in a state's regulatory environment is associated with multiple rate-setting methods, reimbursement per diem, implementation of formal appeals to protest rate review outcomes, and frequent rate reviews.

Stringency of CON regulations included three indicators from data for 1978 collected by Bice and Urban (1982): (1) whether some localized or statewide standard is used for assessing need for beds in a state's CON program; (2) whether the primary goal of a state's CON program is to control the locations of services and facilities and to encourage regionalization and shared service arrangements, or whether the CON program is constraint-oriented, aimed at controlling expansion of services and facilities; and (3) the capital expenditures threshold under a state's CON law. Highly stringent environments are those in which statewide standards are used, where CON programs are constraint-oriented, and where the capital expenditure threshold is low.

A principal components analysis was performed on all seven indicators, yielding a single factor with an eigenvalue of 4.22. All seven indicators had factor loadings of .30 or better. For ease of interpretation, however, an overall additive scale for regulatory stringency was composed of the standardized values of the seven indicators.

System-model presence. One measure using 1979 data from the American Hospital Association Validation Survey of Multihospital Systems (American Hospital Association, 1979): the ratio of community hospital beds controlled by multihospital systems to the total number of community hospital beds in a state.

Organizational characteristics. Three dummy variables indicated location in the East, West, or South (omitted comparison category = North). Hospital size was the number of beds set up and staffed for use in 1982. Hospital ownership in 1982 included three dummy variables indicating religious control, for-profit control, and government control, with secular nonprofit control the omitted comparison category.

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SBU STRATEGIES, CORPORATE-SBU RELATIONS, AND SBU EFFECTIVENESS IN STRATEGY IMPLEMENTATION

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In a departure from earlier studies focusing only on the effects of corporate strategies, this study examined the effects of strategic business units' (SBUs') strategies on the utility of various states of corporate-SBU relations. For SBUs trying to build market share or to pursue differentiation as a competitive strategy, openness in corporate-SBU relations and subjectivity in performance assessment were found to be positively associated with effectiveness; for SBUs trying to maximize short-term earnings or to pursue low cost as a competitive strategy, the corresponding associations were found to be negative. In contrast, corporate-SBU decentralization emerged as positively associated with SBUs' effectiveness irrespective of their strategic contexts; although SBUs' competitive strategies moderated the magnitude of that association, their strategic missions did not.

Perhaps the most salient topic in analyses of how multibusiness firms should be managed has been relations between corporations and their strategic business units (SBUs). The topic was certainly of primary concern to executives as diverse as Alfred Sloan of General Motors, Ralph Cordiner of General Electric, and Harold Geneen of ITT (Cordiner, 1956; Geneen, 1985; Sloan, 1964). Importantly, it also has been the primary issue examined in some prominent studies in business history (Chandler, 1962), organization theory (Lorsch & Allen, 1973; Ouchi, 1984), strategic management (Rumelt, 1974), management control (Vancil, 1980), and even institutional economics (Williamson, 1970).

It is curious that, despite the sheer number and the generally outstanding quality of the studies, this stream of research continues to suffer from a major limitation: although it has examined the effects of strategic context at a corporate level on the management of corporate-SBU relations, it has completely overlooked the impact that SBU-level strategic context might also have on those relations. SBUs' own strategic contexts are important because competitive battles are fought primarily at the SBU rather than the corporate level (Anderson & Zeithaml, 1984; Hambrick, 1983; Porter, 1980). Further, as

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this study suggests, there exist theoretical grounds for expecting SBUs' strategic contexts to affect the management of relations between parent corporations and their SBUs.

To help redress this deficiency, the present study examined the effects of two dimensions of SBUs' strategic contexts—strategic mission and competitive strategy—on the performance implications of three aspects of corporate-SBU relations. The three aspects are (1) the openness of the relationship between an SBU's general manager and his or her superior, (2) corporate use of subjectivity in assessments of the performance of SBU managers, and (3) corporate-SBU decentralization.

THEORETICAL BACKGROUND

Although several reasons exist for expecting SBUs' strategic contexts to influence the utility of various states of corporate-SBU relations, the dominant rationale derives from the information-processing perspective on organization design (Duncan, 1973; Egelhoff, 1982; Galbraith, 1973; Tushman & Nadler, 1978). Building on March and Simon (1958), advocates of this perspective have argued that unless an organization's information-processing capacity adequately meets its need for information processing, the decisions that emerge will be flawed or late, thereby resulting in suboptimal performance.

Every SBU must explicitly or implicitly make a series of ongoing decisions along many dimensions pertaining to inputs (labor, raw materials, capital), throughputs (technology, capacity, quality), and outputs (marketing, distribution, service). Further, since managers are neither omniscient nor omnipotent, many decisions must be modified in whole or in part as events unfold over time and new information is generated. The underlying premise of this study was that the need for such mid-course modifications will differ systematically across different SBU-level strategic contexts. More specifically, I expected that some strategic contexts would be associated with greater task uncertainty than others and that SBUs in such contexts would thereby require more frequent mid-course modifications.

It is obvious that the greater the need for mid-course modifications in strategic decisions, the greater is the need for internal information-processing capacity within an SBU. However, because SBUs within corporations are not freestanding entities, modifications in their strategic decisions would also require interaction with corporate management for these reasons: (1) A decision may imply a modification in the amount, the timing, or both, of the allocation of financial and other resources by an SBU's parent corporation. (2) Because of interdependence among SBUs, a business may need to factor in the secondary implications for other units when modifying decisions that superficially pertain only to itself. Finally, (3) modification of a decision may require renegotiation of the specific goals to be accomplished by an SBU as well as the specific timing of those accomplishments. Accordingly, for SBUs requiring more frequent mid-course modifications in strategic decisions,

the quality and timing of modifications is likely to be better when the information-processing capacity of the corporate-SBU dyad is high than when it is low.

Corporate-SBU Relations: Dimensions of Interest

Although no previous study has examined corporate-SBU relations in the context of SBU-level strategy, literature on the subject rooted in strategy at the corporate level can nonetheless serve as a useful guide for selecting the relational dimensions to address. The results of this stream of research can be summarized as follows: a high level of corporate diversification is associated with (1) divisional, rather than functional, structures (Chandler, 1962; Grinyer, Yasai-Ardekani, & Al-Bazzaz, 1980; Rumelt, 1974), (2) more formal mutual coordination of decisions between corporate and SBU managers (Bower, 1970; Lorsch & Allen, 1973), (3) formula-based and strictly financial performance—oriented incentive systems for SBUs' managers (Kerr, 1985; Pitts, 1974; Salter, 1973), and (4) high decentralization, with functional authority largely in the hands of SBUs' managers (Vancil, 1980). Of the four dimensions, the present study focused on aspects of only the last three—mutual coordination, incentive systems, and decentralization. Since all SBUs in this study came from firms with divisional structures, there was no variance in corporate-SBU relations along the first dimension. For the other three dimensions, the specific aspects chosen for study were: openness in corporate-SBU relations (mutual coordination), corporate use of subjectivity in assessments of an SBU manager's performance for the purposes of bonus determination (incentive systems), and extent of decentralization of strategic decisions to an SBU (decentralization). I expected that the information-processing capacity of corporate-SBU dyads would be high when corporate-SBU relations are open, when subjectivity in performance assessment is high, and when decentralization is high.

Openness in corporate-SBU relations refers to the degree to which relations between SBUs' managers and their corporate superiors are open and informal and allow for spontaneous and open exchange of information and ideas. True, mutual coordination of strategic decisions also depends on the features of a corporation's strategic planning system. However, the primary utility of formal planning systems lies in forcing strategic reviews at pre-specified intervals—once every year, for example—and not in enabling ongoing adjustments during the course of the year (Lorange & Vancil, 1978). Since the impetus for ongoing adjustments would come generally from unexpected environmental events, their appropriateness depends primarily on openness and informality in relations between a corporation and an SBU, not on a formal planning system. Further, since a major objective of formal planning systems is to compare various SBUs for resource allocation (Lorange & Vancil, 1978), such systems are unlikely to differ across SBUs in the same corporation. What would differ across SBUs is how a planning system actually works, which is a function of the extent of openness and informality between an SBU's general manager and the corporate superior.

The second variable, subjectivity in performance assessment, derives from the empirical findings of Lorsch and Allen (1973) and Pitts (1974). Essentially, a bonus award for any SBU's general manager can be determined on the basis of either a strict formula, such as a certain percentage of the SBU's operating profits, or a purely subjective assessment by corporate superiors, or some combination of the two. Objective formulas have the merit of precision and detailed a priori specification, but they suffer from an inability to tie rewards to difficult-to-quantify, yet important, performance dimensions like research and development or human resource management. Since subjective approaches for bonus determination have exactly the opposite qualities, an appropriate combination of the two is generally likely to be superior to a formula-based approach alone. The present study focused on subjectivity in performance assessment because high subjectivity would almost always imply and occur simultaneously with high corporate involvement in and understanding of ongoing events, decisions, and actions of an SBU. Compared to involvement limited to assessment of quarterly or year-end outcomes, such a high level of involvement in effect increases the information-processing capacity of corporate-SBU dyads.

Finally, the variable decentralization refers to the degree of influence that an SBU's general manager has on the major decisions pertaining to the focal SBU relative to the influence of corporate superiors. The importance of the variable for the present study derives from the anticipation that decentralization increases information-processing capacity by pushing the locus of responsibility down towards an SBU, thereby helping prevent an overloading of a corporate-SBU dyad; thus, to the extent that different strategies imply different information-processing needs, the utility of decentralization is likely to vary across SBUs' strategic contexts.

SBUs' Strategic Contexts: Dimensions of Interest

This study focused on two very different dimensions of strategic context at the level of SBUs: (1) an SBU's *strategic mission* in a corporate portfolio (Henderson, 1970) and (2) its *competitive strategy* vis-à-vis other firms in its industry (Porter, 1980). These dimensions not only have been of major interest to researchers as well as practitioners but also appear important on logical grounds.

Strategic mission. All businesses compete for customers in an external product-market environment. However, unlike the context of freestanding single-business firms, the strategic context of an SBU within a diversified firm is also substantially influenced by the role the business is intended to play in the corporate portfolio (Hambrick, MacMillan, & Day, 1982; Henderson, 1970; Hofer & Schendel, 1978; Larreche & Srinivasan, 1982), that is, its strategic mission. Because the markets in which different SBUs compete are often differentially attractive, and because different SBUs possess different competitive strengths, SBUs are rarely equally attractive candidates for either long-term market-share building or short-term maximization of profits and cash flow (Abell & Hammond, 1979). Thus, multibusiness corporations

must decide explicitly or implicitly what strategic mission each SBU will pursue. I describe the strategic extremes open to ongoing businesses as "build" and "harvest" missions. A build strategic mission implies a goal of increased market share, even at the expense of short-term earnings and cash flow. Such a mission, which typically also implies net capital investment into an SBU, is likely in the case of businesses with weak competitive positions in markets that are otherwise very attractive (Abell & Hammond, 1979). At the other extreme, a harvest strategic mission implies a goal of maximizing short-term earnings and cash flow, even at the expense of market share. Such a mission, which typically also implies net capital disinvestment from an SBU, is likely in the case of businesses with strong competitive positions in -markets that have otherwise become unattractive (Abell & Hammond, 1979). True, growth in market share need not always imply reduction in short-term earnings and cash flow, or vice versa (Hambrick et al., 1982; Zeithaml & Fry, 1984); however, such trade-offs often do need to be made (Buzzell & Wiersema, 1981; Zeithaml & Fry, 1984: 851). For identifying an SBU's strategic mission, what is critical is the type of trade-off that would be made if one were necessary.

Competitive strategy. Consistent with Porter's (1980) conceptualization, in this study competitive strategy signifies an SBU's intended basis for achieving a competitive advantage over other firms in an external product-market. According to Porter's conceptualization, which Dess and Davis (1984) and Hambrick (1983) supported empirically, the two generic bases for achieving competitive advantages are "differentiation" and "low cost." A strategy of differentiation, exemplified by Mercedes Benz in automobiles and Sony in television sets, implies "creating something that is perceived *industrywide* as being unique . . . . [Such a] strategy does not allow the firm to ignore costs, but rather they are not the primary strategic target" (Porter, 1980: 37). In contrast, a strategy of low cost, exemplified by Chevrolet in automobiles and Emerson in television sets, implies that "low cost relative to competitors becomes the running theme through the entire strategy, though quality, service, and other areas cannot be ignored" (Porter, 1980: 35). As with strategic mission, trade-offs along this dimension may not always have to be made. The critical aspect for defining the competitive strategy of an SBU is the type of trade-off that it would make if one were necessary.

Given their totally different conceptualizations, strategic mission and competitive strategy are regarded here as orthogonal dimensions. As will be seen, actual data support the premise. The next two subsections argue, for quite different reasons, that SBUs located at different points along each of the two strategic dimensions may face differing degrees of task uncertainty, and thereby have differing needs for information-processing capacity; accordingly, the utility of different states of corporate-SBU relations is hypothesized to vary across different SBUs' strategic contexts. It should be noted that the relationship between SBUs' strategies and the information-processing capacity of a corporate-SBU dyad is almost certainly more complex

than what this study describes and discusses. Although information-processing capacity influences the effectiveness and efficiency with which strategies are implemented, it is conceivable that choice of strategies may itself be in part a function of information-processing capacity.

Strategic Mission and Corporate-SBU Relations

My specific expectation is that SBUs on build strategic missions face greater task uncertainty than those on harvest missions; following Galbraith (1973: 5), I use task uncertainty to signify the relative amount of information that must be acquired during task performance. Three arguments support this expectation. First, by definition, a build mission signifies a desire to increase market share, whereas a harvest mission signifies at best an indifference towards it. Because the total market share of all firms in an industry would always be 100 percent, making the battle for market share a zero-sum game, a build mission pits an SBU into greater conflict with its competitors than a harvest mission does. As Pfeffer and Salancik (1978: 68) argued, the greater the degree of conflict between an organization and actors in its external environment, the greater the uncertainty it confronts. Second, it is also clear that the decision to increase market share makes an SBU engaged in a build mission more dependent on the decisions and actions of customers and competitors than an SBU that is harvesting. To increase market share, it is not sufficient to increase the demand for products; a firm must also increase the input of resources and the volume of production by corresponding amounts. Thus, even on the input side, a manager who is building faces greater external dependencies than does a manager who is harvesting. As Pfeffer and Salancik (1978: 68) and Thompson (1967: 29) argued, given a nondeterministic world, the greater the external dependencies facing an organization, the greater the uncertainty it confronts. Third, businesses are more likely to undertake build strategies in the early, rather than later, stages of a product's life cycle (Hofer, 1975). Given the relative unpredictability of market demand and the instability of the rules of the game for most industries in the early stages of a life cycle (Porter, 1980), on this account as well, task uncertainty is likely to be greater for SBUs pursuing build, rather than harvest, missions.

As was discussed, the greater the uncertainty in a task environment, the greater is an organization's need for information-processing capacity (Duncan, 1973; Galbraith, 1973; Tushman & Nadler, 1978). Accordingly, for effective implementation, build missions should call for greater organizational information-processing capacity than harvest missions. Combining that expectation with the earlier discussion on the information-processing capacities of various states of corporate-SBU relations yields:

> *Hypothesis 1: Openness in corporate-SBU relations will make a positive contribution to an SBU's effectiveness at the build end of the strategic-mission spectrum; in contrast, towards the harvest end, its contribution will be either less strongly positive, or negative.*

> *Hypothesis 2: Subjectivity in performance assessment will make a positive contribution to an SBU's effectiveness at the build end of the strategic-mission spectrum; in contrast, towards the harvest end, its contribution will be either less strongly positive, or negative.*

> *Hypothesis 3: Corporate-SBU decentralization will make a positive contribution to an SBU's effectiveness at the build end of the strategic-mission spectrum; in contrast, towards the harvest end, its contribution will be either less strongly positive, or negative.*

Arguments not premised on task uncertainty further support the hypotheses. First, because SBUs that are on build missions are generally newer than SBUs on harvest missions, corporate executives are likely to have less direct personal experience in and intuitive knowledge of the first type. Yet the need to make ongoing capital investments into the building SBUs requires that corporate understanding of such SBUs' competitive contexts be high. Thus, administrative mechanisms, such as open and informal corporate-SBU relations, that can help corporate executives become more knowledgeable about an SBU are likely to be particularly beneficial for SBUs engaged in building. Second, because of their orientation toward increasing long-term market share, SBUs that are building generally need to place greater emphasis than SBUs that are harvesting on many difficult-to-quantify performance dimensions like product-market development and human resource development. A reliance on subjective, rather than formula-based, approaches to performance assessment is more likely to encourage that emphasis and thus is likely to prove more beneficial for SBUs that are building than for those that are harvesting. Finally, because of their goal of winning a competitive battle for market share, general managers of SBUs that are building need to focus more on customers and their market than on intracorporate issues; the reverse would be true for SBUs engaged in harvesting. Accordingly, corporate SBU decentralization is also likely to be more beneficial for the first type of SBU.

Competitive Strategy and Corporate-SBU Relations

The choice of a strategy of differentiation rather than low cost would also increase uncertainty in an SBU's task environment. The primary concern of SBUs pursuing cost leadership is likely to be maximizing their throughput efficiency, which generally implies having narrow product lines so that they can keep inventory-carrying and distribution costs low and maximally realize the cost advantages of mass production (Hambrick, 1983). In contrast, success at implementing the differentiation strategy is likely to require primary attention to the unique identification of unfilled customer needs and the design and production of unique products to meet those needs. Since there are usually many ways to achieve uniqueness, and achieving differentiation requires creating "a perception of exclusivity" (Porter, 1980: 38), the product lines of SBUs pursuing differentiation would generally be broader

than those of SBUs pursuing low cost (Hambrick, 1983). Such breadth
implies that SBUs pursuing differentiation rather than low cost are likely
to face greater uncertainties in their task environments. Given their prefer-
ence for cost minimization, SBUs with low cost as their strategy are also
likely to keep their product offerings stable over time. In contrast, for SBUs
pursuing differentiation, sustaining uniqueness is almost always more im-
portant than low cost. Thus, they are also likely to exhibit greater product
innovation and greater dynamism, or changes over time, in product mix than
will SBUs pursuing cost leadership (Dess & Davis, 1984). Again, SBUs pursu-
ing differentiation are predicted to face more uncertain task environments
than those pursuing low cost.

 As discussed earlier, the greater environmental uncertainty faced by
SBUs pursuing differentiation implies a need for greater information-
processing capacity. Combining that expectation with expectations concern-
ing the differing information-processing capacities of different states of
corporate-SBU relations yields:

> *Hypothesis 4: Openness in corporate-SBU relations will*
> *make a positive contribution to an SBU's effectiveness at*
> *the differentiation end of the competitive-strategy spec-*
> *trum; in contrast, towards the low-cost end, its contribu-*
> *tion will be either less strongly positive, or negative.*

> *Hypothesis 5: Subjectivity in performance assessment will*
> *make a positive contribution to an SBU's effectiveness at*
> *the differentiation end of the competitive-strategy spec-*
> *trum; in contrast, towards the low-cost end, its contribu-*
> *tion will be either less strongly positive, or negative.*

> *Hypothesis 6: Corporate-SBU decentralization will make*
> *a positive contribution to an SBU's effectiveness at the*
> *differentiation end of the competitive-strategy spectrum;*
> *in contrast, towards the low-cost end, its contribution will*
> *be either less strongly positive, or negative.*

 Further arguments not premised on task uncertainty support Hypothe-
ses 4–6. Creating and sustaining differentiation requires incurring discretion-
ary expenditures in several areas—improvement of quality and speed of
delivery, advertising to build an image, research and development, and so
forth. In contrast, a low-cost strategy implies economies in all forms of discre-
tionary expenditures. Cost savings are easy to measure, but the potential
differentiating benefits of high discretionary expenditures are not. Accord-
ingly, implementing differentiation strategies is likely to require decision
making by intuitive judgment to a greater extent than will implementing
low-cost strategies. It follows that SBUs pursuing differentiation need greater
corporate-SBU openness, informality, and subjective approaches to perfor-
mance assessment than do those pursuing low cost if those intuitive deci-
sions are to be made and assessed correctly. Additionally, because SBUs
pursuing low cost as a strategy have greater need for scale economies, they

are likely to benefit from and engage in inter-SBU resource sharing more than those pursuing differentiation (Gupta & Govindarajan, 1986). Because corporate-SBU centralization can help provide the needed coordination among SBUs, decentralization is likely to be less beneficial for businesses pursuing low cost.

METHODS

I collected data for this study from the general managers of 58 SBUs within eight diversified *Fortune* 500 firms headquartered in the northeastern United States. Using Rumelt's (1974) criteria, I classified six of the firms as related-diversified and two as unrelated-diversified. Although limitations on obtaining access to firms and constraints of time and funding prevented the use of a random sample from the entire *Fortune* 500, the range of sizes in terms of sales ($500 million to $10 billion in 1981) as well as the diversity of industries in which the firms operate[1] indicated no prima facie reason to expect any systematic bias in the findings from their business units. Nonetheless, given the variations in corporate diversification strategies as well as in corporate size, I tested the hypotheses both before and after controlling for the possible confounding effects of those two contextual variables.

Within each firm, I interviewed one or more corporate senior executives and persuaded them to send copies of a questionnaire to four or more general managers of SBUs with a request that this distribution cover a mix of strategically diverse businesses. A cover letter accompanying the questionnaire guaranteed respondents' anonymity and assured them that only aggregate data from multiple business units would be published. Of the 70 questionnaires distributed by corporate executives, I received 58 usable responses, 48 from the six related- and 10 from the two unrelated-diversified firms. Because of the high response rate, no tests for response bias seemed necessary.

Measurements

The Appendix gives details on how the variables of interest—strategic mission, competitive strategy, openness of corporate-SBU relationship, subjectivity in performance assessment, corporate-SBU decentralization, and SBU's effectiveness—were measured; also included therein are test results supporting the reliability and the validity of measures. Table 1 provides both summary statistics and zero-order correlation coefficients for all variables. Those data lend support to statements made earlier in this paper regarding the orthogonality of the two dimensions of SBU-level strategic context under consideration.

Since an SBU's effectiveness is the dependent variable in all six of the predicted hypotheses, a brief elaboration on my approach to measuring that key variable might be useful here. Given corporations' desire for confidentiality, objective data on the financial performance of individual SBUs that

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[1] The group studied included producers of consumer as well as industrial products in both mature and high-growth industries.

TABLE 1
Summary Statistics and Zero-Order Correlation Coefficients for All Variables[a]

Variables	Range	Means	s.d.	1	2	3	4	5
1. SBU's effectiveness	1.46–4.80	3.21	0.74					
2. Strategic mission	−1.00–1.00	−0.03	0.51	.13				
3. Competitive strategy	5.00–10.00	7.79	1.24	.02	−.07			
4. Openness of relationship	1.75–4.00	3.15	0.60	.13	.26*	.30*		
5. Subjectivity in performance assessment	0.00–100.00	26.81	32.89	.11	.25*	−.17	.13	
6. Decentralization	0.60–4.38	1.86	0.75	.25*	.12	.13	.08	.08

[a] $N = 58$.
* $p < .05$, one-tailed test.

reveal organizational identities are virtually impossible to obtain.[2] Lawrence and Lorsch (1967) also faced that constraint. Further, I expected that the absolute financial performance of any business unit would depend not just on the effectiveness with which it implements its chosen strategies but also on the state of the economy, industry characteristics, and the choices of strategies themselves (Lenz, 1981). Thus, even if objective financial data could somehow be obtained, they would be meaningless from the perspective of this study unless the effects of economy, industry, and strategic choice were first factored out—yet another virtually impossible task. In light of these considerations and the fact that managers' a priori expectations of performance are likely to take into account the expected effects of industry- and strategy-related factors, I measured SBUs' performance in the form of a comparison between actual performance and a priori expectations rather than on an absolute scale. In the interest of increasing validity, I also decided (1) to assess performance along several dimensions rather than on any single dimension and (2) to weight the various performance dimensions in terms of their relative importance for an SBU. Such a multivariate approach with criterion weights is consistent with Steers's (1975) advice and seemed particularly appropriate for taking into account the differing priorities implied by different strategic contexts. As the data in Table 1 show, the resulting index of effectiveness does not correlate with either strategic mission or competitive strategy, indicating that the research design appears to have adequately controlled for the effects of strategic context on performance.

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[2] Data in the Profit Impact of Market Strategies (PIMS) data base do not, for instance, include organizational identities.

Controlling for Corporate Diversity and Size

Given the potential for a corporation's diversification strategy and size to influence corporate-SBU relations, it seemed important to control for the possible confounding effects of those two contextual variables. For computational purposes, I made corporate diversification strategy (U) a binary variable, assigning the 48 SBUs from the six related-diversified firms the value $U = 0$, and assigning the other 10 SBUs from the two unrelated-diversified firms the value $U = 1$. I measured corporate size (Z) in terms of total corporate revenue in billions of dollars; given the extreme variability in size, I decided to use the natural logarithms of revenues rather than absolute figures.

Analysis

Hypotheses 1 through 6 are all of the following form: the effect of X_1 (e.g., openness) on Y (SBU's effectiveness) will be positive when X_2 (e.g., strategic mission) is high; however, when X_2 is low, that effect will be either less strongly positive, or negative. Mathematically, that specification implies that $\partial Y/\partial X_1$ will be a function of X_2:

$$\frac{\partial Y}{\partial X_1} = a_1 + bX_2 \, ,$$

where b is predicted to be positive. In order to control for any potential confounding effects of corporate diversification strategy (U) and corporate size (Z), I modified the equation to:

$$\frac{\partial Y}{\partial X_1} = a_1 + (b_1 + b_2U + b_3Z)X_2 .$$

With that modification, b_1 provided the exact test for each hypothesis after effects of corporate context had been controlled, b_2 captured any marginal effects of corporate diversification strategy, and b_3 captured any marginal effects of corporate size. For statistical purposes, I then integrated the equation over X_1 and rewrote it as:

$$Y = c + a_1X_1 + a_2X_2 + b_1X_1X_2 + b_2UX_1X_2 + b_3ZX_1X_2 .$$

Following that equation as the general model, I computed three multiple regressions for each of the six hypotheses, the first with just X_1 and X_2, the second with X_1, X_2, and X_1X_2, and the third with X_1, X_2, X_1X_2, $UX_1 X_2$, and ZX_1X_2. Mathematically, for any independent variable in a multiple regression equation, the significance of the regression coefficient (computed through a two tailed t-test) always equals the significance of the increase in R^2 (computed through an F-test) that is due to the introduction of the particular variable into the equation. Thus, in my general equation, a significant value for b_1 also implies that the introduction of the term X_1X_2 added significantly to the variance explained over and beyond that explained by the other four

independent variables. Argote (1982), Brownell (1981), and Schoonhoven (1981) used this specific model of contingency relationships, and Southwood (1978) discussed and supported the mathematical properties of the model at length.

RESULTS

Effects of Strategic Mission

Table 2 presents the results of the multiple regression analyses undertaken to test Hypotheses 1, 2, and 3.[3]

Openness in corporate-SBU relations. For Hypothesis 1, dealing with the effect of strategic mission (M) on the utility of openness in corporate-SBU relations (R), the results are clearly supportive. As Equations 2 and 3 indicate, the coefficient of the interaction term, MR, is positive and significant both before ($p < .01$) and after ($p < .05$) potential confounding effects of corporate diversity and size are controlled. To determine exactly how the beneficial effects of openness in corporate-SBU relations vary across different strategic missions, I conducted a further analysis, employing this partial derivative of Equation 2:

$$\frac{\partial E}{\partial R} = .216 + .694M.$$

Over the observed range of the strategic-mission variable (−1.000 to 1.000; see Table 1), it can be calculated that $\partial E/\partial R$ is positive for $1.000 > M > -.311$ and negative for $-.311 > M > -1.000$. To sum up, for SBUs at the build end of the strategic-mission spectrum, the effect of openness on effectiveness is positive; however, at the harvest end, its effect is negative. Thus, results support both the first and the second parts of Hypothesis 1.

Subjectivity in performance assessment. For Hypothesis 2, dealing with the effect of strategic mission (M) on the utility of subjectivity in performance assessment (S), the results are again strongly supportive. As Equations 5 and 6 indicate, the coefficient of the interaction term, MS, is positive and significant ($p < .01$) both before and after the potential confounding effects of corporate diversity and size are controlled. This partial derivative of Equation 5 yields further analysis of the results:

$$\frac{\partial E}{\partial S} = -.001 + .015M.$$

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[3] Both Tables 2 and 3 report unstandardized regression coefficients. That decision was based upon Southwood's (1978) mathematical analysis, which I crosschecked empirically. The analysis indicated that if the points of origin of X_1 and X_2 are changed, the values, as well as the significance levels, of both standardized and unstandardized regression coefficients of the variables X_1 and X_2 will also change. However, for the cross-product term $X_1 X_2$, the value of the unstandardized, but not the standardized, regression coefficient; its standard error; and its level of significance are always independent of the points of origin of X_1 and X_2. Since virtually all variables in this study are interval-scale variables, their points of origin are arbitrary, rendering the standardized—but not the unstandardized—regression coefficients essentially meaningless.

TABLE 2
Results of Multiple Regression Analyses
of Strategic Mission and Corporate-SBU Relations on SBU Effectiveness[a]

Results of Equations[b,c]	Eq.	R^2	F[d]	ΔR^2	F[d]
Hypothesis 1					
$E = 2.759 + 0.076M + 0.138R$ (.206)　(.172)	1	.02	0.50 (2,55)		
$E = 2.460 - 2.098M* + 0.216R + 0.694MR**$ (.822)　(.165)　(.255)	2	.14	2.85* (3,54)	.12	7.41** (1,54)
$E = 2.532 - 2.044M* + 0.193R + 0.675MR* - 0.264UMR + 0.156ZMR$ (.826)　(.166)　(.257)　(.248)　(.158)	3	.17	2.02+ (5,52)	.03	0.85 (2,52)
Hypothesis 2					
$E = 3.179 + 0.308M + 0.001S$ (.204)　(.003)	4	.06	1.46 (2,55)		
$E = 3.173 - 0.079M - 0.001S + 0.015MS**$ (.241)　(.003)　(.006)	5	.18	3.48* (3,54)	.12	7.17** (1,54)
$E = 3.151 - 0.123M + 0.001S + 0.018MS** - 0.027UMS - 0.010ZMS$ (.244)　(.003)　(.006)　(.024)　(.012)	6	.22	2.54* (5,52)	.04	1.25 (2,52)
Hypothesis 3					
$E = 2.767 + 0.133M + 0.232D^+$ (.189)　(.129)	7	.07	2.03 (2,55)		
$E = 2.773 + 0.304M + 0.231D^+ - 0.089MD$ (.481)　(.131)　(.229)	8	.07	1.38 (3,54)	.00	0.15 (1,54)
$E = 2.797 + 0.361M + 0.209D - 0.099MD - 0.250UMD - 0.065ZMD$ (.541)　(.137)　(.264)　(.408)　(.242)	9	.09	0.94 (5,52)	.02	0.34 (2,52)

[a] N = 58. Unstandardized regression coefficients are reported.

[b] Figures in parentheses represent standard errors.

[c] E = SBU's effectiveness, M = SBU's strategic mission, U = corporate diversification strategy, Z = corporate size, R = openness of relationship, S = subjectivity in performance assessment, and D = decentralization.

[d] Figures in parentheses represent degrees of freedom.

+ $p < .10$, two-tailed t-test.

* $p < .05$, two-tailed t-test.

** $p < .01$, two-tailed t-test.

Over the observed range of the strategic-mission variable, it can be calculated that $\partial E/\partial S$ is positive for $1.000 > M > .067$ and negative for $.067 > M > -1.000$. Thus, at the build end of the spectrum of strategic missions, the effect of subjectivity on effectiveness is positive; however, at the harvest end, it is negative. Thus, results support both the first and the second parts of Hypothesis 2.

Decentralization. For Hypothesis 3, dealing with the effect of strategic mission (M) on the utility of corporate-SBU decentralization (D), the results are not supportive. As Equations 8 and 9 indicate, the coefficient of the interaction term, MD, is not significantly different from zero either before or after the potential confounding effects of corporate diversity and size are controlled.

To shed more light on what, if any, relationship exists between corporate-SBU decentralization and an SBU's effectiveness, I conducted a further analysis with this partial derivative of Equation 8:

$$\frac{\partial E}{\partial D} = .231 - .089M .$$

As can be calculated, $\partial E/\partial D$ is positive over the entire observed range of the strategic-mission variable, $1.000 > M > -1.000$. Further, the value of $\partial E/\partial D$ is somewhat greater for SBUs engaged in a harvesting strategy than for those engaged in building. Thus, the data are consistent with the first part of Hypothesis 3 but not with the second part.

Effects of Competitive Strategy

Table 3 presents the results of multiple regression analyses undertaken to test Hypotheses 4, 5, and 6.

Openness in corporate-SBU relations. For Hypothesis 4, dealing with the effect of competitive strategy (C) on the utility of openness in corporate-SBU relations (R), the results are clearly supportive. As Equations 11 and 12 indicate, the coefficient of the interaction term, CR, was positive and significant both before ($p < .01$) and after ($p < .05$) I controlled for the potential confounding effects of corporate diversity and size.

A further analysis of the results, intended to determine exactly how the beneficial effects of openness in corporate-SBU relationship vary across different competitive strategies, employed this partial derivative of Equation 11:

$$\frac{\partial E}{\partial R} = -2.469 + .339C .$$

Over the observed range of the competitive-strategy variable (5.000 to 10.000; see Table 1), it can be calculated that $\partial E/\partial R$ is positive for $10.000 > C > 7.283$ and negative for $7.283 > C > 5.000$. To sum up, for SBUs pursuing a competitive strategy of differentiation, the effect of openness on effectiveness is

TABLE 3
Results of Multiple Regression Analyses
of Competitive Strategy and Corporate-SBU Relations on SBU Effectiveness[a]

Results of Equations[b,c]	Eq.	R^2	F^d	ΔR^2	F^d
Hypothesis 4					
$E = 2.943 - 0.042C + 0.181R$ $\quad\quad\quad (.086)\quad (.174)$	10	.02	0.55 (2,55)		
$E = 11.109 - 1.096C^{**} - 2.469R^* + 0.339CR^{**}$ $\quad\quad\quad\quad (.385)\quad\quad (.959)\quad\quad (.121)$	11	.15	3.03* (3,54)	.13	7.86** (1,54)
$E = 10.665 - 1.041C^* - 2.302R^* + 0.319CR^* - 0.009UCR + 0.006ZCR$ $\quad\quad\quad\quad (.396)\quad\quad (.994)\quad\quad (.125)\quad\quad (.011)\quad\quad (.009)$	12	.16	1.92 (5,52)	.01	0.37 (2,52)
Hypothesis 5					
$E = 2.695 + 0.055C + 0.003S$ $\quad\quad\quad (.087)\quad (.003)$	13	.02	0.50 (2,55)		
$E = 3.538 - 0.052C - 0.030S + 0.004CS^{\dagger}$ $\quad\quad\quad\quad (.104)\quad (.019)\quad (.002)$	14	.08	1.38 (3,54)	.06	3.09† (1,54)
$E = 3.575 - 0.056C - 0.035S + 0.005CS^{\dagger} + 0.000UCS + 0.000ZCS$ $\quad\quad\quad\quad (.108)\quad (.025)\quad (.003)\quad\quad (.001)\quad\quad (.001)$	15	.08	0.81 (5,52)	.00	0.05 (2,52)
Hypothesis 6					
$E = 2.578 + 0.022C + 0.238D^{\dagger}$ $\quad\quad\quad (.083)\quad (.130)$	16	.06	1.81 (2,55)		
$E = 4.545 - 0.227C - 0.823D + 0.133CD$ $\quad\quad\quad\quad (.204)\quad (.806)\quad (.100)$	17	.09	1.81 (3,54)	.03	1.78 (1,54)
$E = 5.405 - 0.369C^{\dagger} - 1.180D + 0.200CD^* - 0.044UCD^* + 0.029ZCD^{\dagger}$ $\quad\quad\quad\quad (.208)\quad\quad (.800)\quad (.100)\quad\quad (.020)\quad\quad (.016)$	18	.18	2.15† (5,52)	.09	2.60† (2,52)

[a] N = 58. Unstandardized regression coefficients are reported.
[b] Figures in parentheses represent standard errors.
[c] E = SBU's effectiveness, C = SBU's competitive strategy, U = corporate competitive strategy, Z = corporate diversification strategy, R = openness of relationship, S = subjectivity in performance assessment, and D = decentralization.
[d] Figures in parentheses represent degrees of freedom.
† $p < .10$, two-tailed t-test.
* $p < .05$, two-tailed t-test.
** $p < .01$, two-tailed t-test.

positive; however, for those whose strategy is to keep costs low, that effect is negative. Thus, results supported both the first and the second parts of Hypothesis 4.

Subjectivity in performance assessment. For Hypothesis 5, dealing with the effect of competitive strategy (C) on the utility of subjectivity in performance assessment (S), the results are again supportive, although less strongly so than for Hypothesis 4. As Equations 14 and 15 indicate, the coefficient of the interaction term, CS, was positive and significant ($p < .10$) both before and after I controlled for the potential confounding effects of corporate diversity and size.

This partial derivative of Equation 14 yields further analysis of the results:

$$\frac{\partial E}{\partial S} = -.030 + .004C .$$

Over the observed range of the competitive-strategy variable, it can be calculated that $\partial E/\partial S$ is positive for $10.000 > C > 7.500$ and negative for $7.500 > C > 5.000$. To sum up, at the differentiation end of the spectrum of competitive strategies, the effect of subjectivity on effectiveness is positive; however, at the low-cost end, the effect is negative. Thus, results support both the first and the second parts of Hypothesis 5.

Decentralization. For Hypothesis 6, dealing with the effect of competitive strategy (C) on utility of corporate-SBU decentralization (D), the results are again supportive, although only after the effects of corporate diversity and size are controlled. As Equations 17 and 18 indicate, the coefficient of the interaction term, CD, is positive and significant ($p < .05$) after, but not before, my controlling for the potential confounding effects of corporate diversity and size.

This partial derivative of Equation 17 yields further analysis of the results:

$$\frac{\partial E}{\partial D} = -.823 + .133C .$$

Over the observed range of the competitive-strategy variable, it can be calculated that $\partial E/\partial D$ is positive for $10.000 > C > 6.188$ and negative for $6.188 > C > 5.000$. Thus, results support both the first and the second parts of Hypothesis 6.

INTERPRETATION OF THE RESULTS

Although the results reported are fully sufficient for testing the hypotheses, for purposes of interpretation I decided to go one step further in examining the data. Specifically, I split the data twice, once by strategic mission and once by competitive strategy. In the first case, I termed the top third of the cases the build subgroup and the bottom third the harvest subgroup and discarded the middle third. Similarly, for the second split, I

termed the top third of the cases the differentiation subgroup and the bottom third the low-cost subgroup, again discarding the middle third. Figure 1 graphs the ordinary-least-squares regression lines between each corporate-SBU relationship variable and SBU effectiveness for all cases and for the subgroups.

As expected, the results presented in Figure 1 are fully consistent with those presented earlier; the objective of graphing the data was not to retest the hypotheses. In any case, the analysis shown in Figure 1 is inferior to that shown in Tables 2 and 3 for testing the hypotheses on at least these two grounds: The creation of nominal strategic subgroups out of continuous variables—in addition to the discarding of a third of the data—results in a significant loss of information; as Dubofsky and Varadarajan (1987) also argued and illustrated, it is almost always preferable to test for the effects of strategies on organizational outcomes using continuous rather than subgroup or nominal measures of strategies. Second, the analysis in Figure 1 does not permit control for any confounding effects of variables related to corporate context. Essentially, the incremental utility of that analysis lies in making the results of this study more intelligible both to practicing managers and to those who must advise or train them. Besides the moderating effects of SBU-level strategic context, perhaps the most useful conclusion to emerge from the graphs is that each of the three corporate-SBU relational variables appears to have a unique relationship with performance.

An examination of Figures 1a and 1b indicates that although the benefi- cial effect of openness in corporate-SBU relations on effectiveness is quite strong in the case of SBUs pursuing build and differentiation strategies, the detrimental effect of openness of effectiveness is almost insignificant for SBUs pursuing harvest and low-cost strategies. In other words, despite the moderating effect of an SBU's strategic context, the upside benefits of a high level of openness in some strategic contexts are much greater than the downside negative effects of openness in other strategic contexts. Accordingly, a practical implication of this study would seem to be the following: if corporate executives find it difficult to fine-tune their degree of openness across SBUs to fit specific SBUs' strategic contexts, it should be preferable to opt for more, not less, openness across the board. Such a conclusion also implies that, on the dimension of openness in relations, the proponents of universalistic (Argyris, 1964; Peters & Waterman, 1982) as well as contin- gency (Galbraith, 1973) perspectives might both be partially correct.

The conclusions regarding subjectivity in performance assessment ap- pear to be different. For some strategic contexts, high subjectivity seems to be strongly desirable (Figure 1d); however, in some other strategic contexts subjectivity seems to be strongly undesirable (Figure 1c). Thus, there ap- pears to be strong justification for fine-tuning the mix of formula-based ver- sus subjective approaches in assessments of SBU managers' performance for the purposes of bonus determination. Specifically, for build and differentia- tion strategies, subjective approaches seem to be more desirable, but for

FIGURE 1
Associations Between Corporate-SBU Relations and SBU's Performance:
An Examination of Subgroup Data[a],[b]

FIGURE 1a

FIGURE 1b

FIGURE 1c

FIGURE 1d

FIGURE 1e

FIGURE 1f
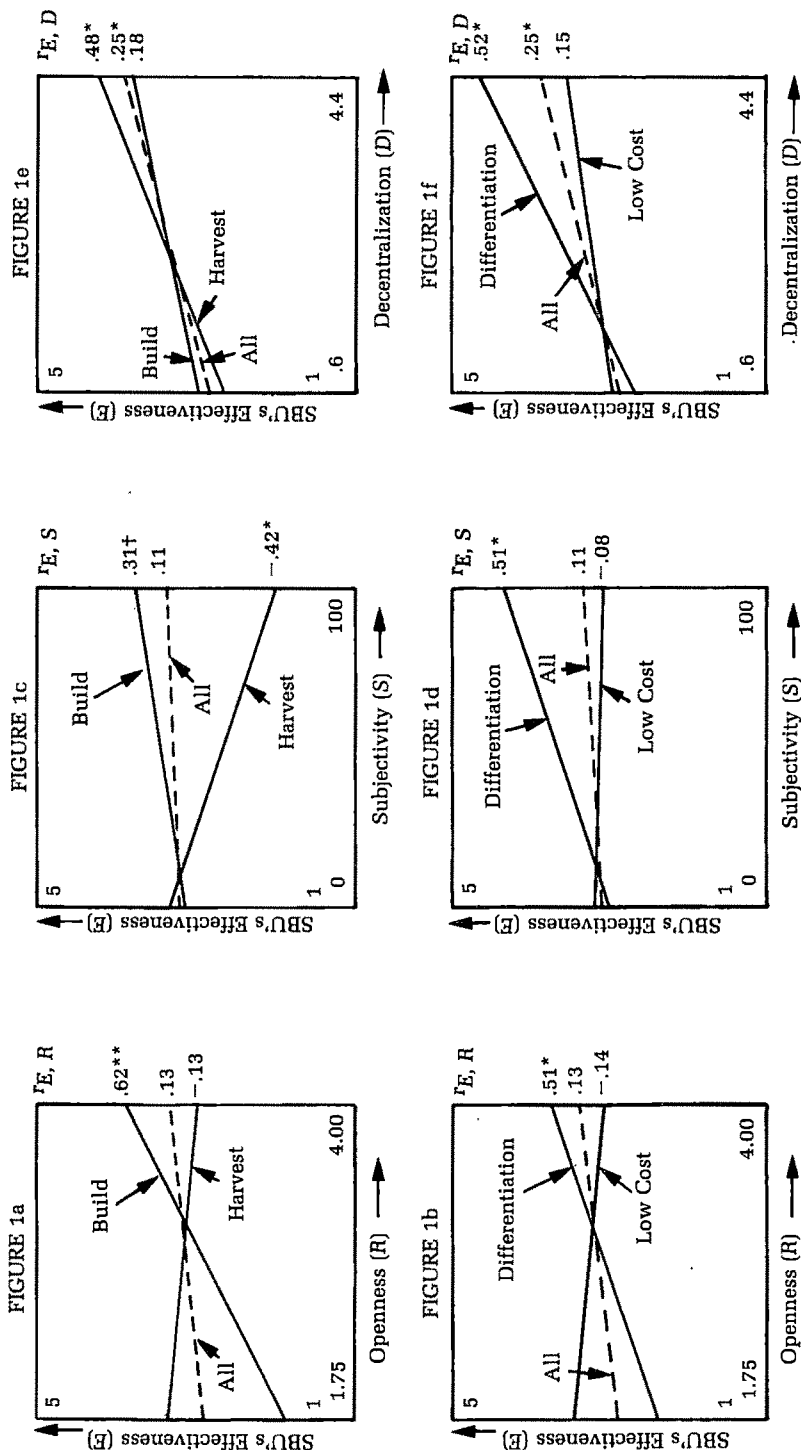
[a] The build and harvest subgroups respectively represent the top and the bottom thirds of cases on the strategic-mission variable. Similarly, the differentiation and the low-cost subgroups represent the top and the bottom thirds on the competitive-strategy variable.

[b] The graphs represent least-square regression lines plotted over the entire observed ranges of the corporate-SBU relationship variables (R, S, and D).

† $p < .10$, one-tailed test; * $p < .05$, one-tailed test; ** $p < .01$, one-tailed test.

harvest and low-cost strategies, formula-based approaches seem to be more desirable.

As for the effect of corporate-SBU decentralization on effectiveness, Figures 1e and 1f seem to suggest that greater decentralization should always be preferred, regardless of an SBU's strategic context, and that the benefits of decentralization would be particularly salient in the case of SBUs pursuing differentiation rather than low cost strategies. Such a conclusion is also consistent with the overall positive correlation between decentralization and effectiveness ($r = .25$, $p < .05$; see Table 1). However, another interpretation is equally plausible. Decentralization might be primarily an outcome rather than a strategy-dependent design variable. It is conceivable that rather than opting for more or less decentralization in order to optimize an SBU's effectiveness, corporate executives might actually be opting for more or less intervention as a response to a current actual level of performance. Although the results of this study do not permit differentiation between those two interpretations, anecdotal evidence cited by Lorsch and Allen (1973) does seem to support the decentralization-as-outcome interpretation: "One division general manager . . . summarized [his view] as follows: 'A high profit contribution does give you a considerable "go to hell factor" in dealing with the headquarters people. But when you are losing, it's a whole new ball game. In fact, I'll say that the amount of supervision that a division receives is directly proportional to the trouble it's in' " (1973: 68). On the basis of a study of 291 manufacturing companies, Vancil (1980) similarly concluded that when an SBU's performance fell below expectations, one or more corporate managers would offer to "help where we can" and that the SBU manager's freedom to take action without prior corporate approval would tend to be sharply curtailed. Although the choice between those two alternative interpretations must await further research, it would seem that at least this conclusion emerges from this study's results: from the perspective of SBU-level strategic context, decentralization is not a highly salient design variable, and the choice of more or less decentralization seems to depend on factors other than strategic context.

CONCLUSIONS

The results of this study indicate that SBUs' strategic contexts do significantly moderate the utility of various states of corporate-SBU relations. Accordingly, this study as well as others like it (Gupta & Govindarajan, 1984), lends impetus to examinations of how SBU-level strategic contexts influence the management of multibusiness firms. Given this study's focus on corporate-SBU relations, it is particularly relevant to note that in focusing on the effects of corporate strategic context, previous research has tended to completely overlook the implications of different SBU-level strategic contexts. That observation is particularly important because although corporate strategy may influence SBUs' strategies, it does not determine them. As Montgomery put it: "Corporate leaders would do well to remember that diversified

firms must ultimately compete in a series of individual markets" (1985: 795). Her observation is also consistent with Burgelman's (1983) conclusion that the same multibusiness firm can easily engage in many strategic choices and that strategic choice at the SBU-level can have major implications for the management of corporate-SBU relations. A recent study by Lamont and Anderson (1985) is also relevant. After finding that mixed approaches to corporate diversification are quite prevalent and that the performance of firms pursuing mixed approaches is not statistically different from that of purely internal or the purely acquisitive diversifiers, they concluded: "Unfortunately, or fortunately, the findings reported here raise more questions that they answer. What structures do mixed diversifiers use? Does structure contribute to performance? " (1985: 933). If "structure" refers to the overall context of corporate-SBU relations, the present study would seem to help address some of Lamont and Anderson's queries.

These appear to be among the more productive directions for future research in this area: (1) an examination of other aspects of corporate-SBU relations, such as management information system, (2) an examination of the effects of other dimensions of SBU-level strategic contexts, such as consumer versus industrial goods or fragmented versus concentrated industry environments, (3) an examination of the joint effect of corporate and SBU-level strategic contexts, and (4) an examination of the effects of various states of corporate-SBU relations on other outcome variables like job satisfaction and turnover among key SBU managers—a major problem in some industries, notably electronics.

Future research should also benefit from a clear identification of some of the major limitations of the present study. Perhaps the most obvious is the self-report nature of the data; although I believe that the results of the reported tests of reliability and validity lend sufficient support to the measures to justify their use, a similar study employing multi-rater measurement approaches would increase confidence in the validity of the proposed theoretical framework. Similarly, a study using larger and more representative samples would increase confidence in the generalizability of the framework. Another limitation of this study is its reliance on cross-sectional data. Although the theoretical discussion preceding the hypotheses implies a specific causality in each case, the snapshot-like quality of the data prevented any tests for such causality; as might be recalled, causality emerged as a particularly intriguing question regarding the association between decentralization and performance. Longitudinal studies would seem to be a more appropriate methodological route for the examination of specific causal linkages.

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APPENDIX A

Strategic mission. Since SBUs usually have several closely related products or product lines, the strategic mission for each SBU was measured by aggregating the differing strategic missions of its various products. Specifically, each general manager was asked to indicate the percentage of an SBU's current total sales accounted for by activities in pursuit of these missions: (1) increase sales and market share, be willing to accept low returns on investment in the short-to-medium term if necessary, (2) maintain market share and obtain reasonable return on investment, (3) maximize profitability and cash flow in the short-to-medium term, be willing to sacrifice market share if necessary, (4) prepare for sale or liquidation, and (5) none of the above. All respondents entered 0 under category 5. The other four items were coded as $+1, 0, -1$, and -2, respectively. I then used the percentage breakdown provided by the SBUs' managers for each item to derive a weighted average measure of strategic mission, with low values indicating a harvest mission and high values indicating a build mission.

The construct validity of this measure was assessed by asking each respondent to provide data on the current market share of an SBU's principal products, a factual rather than perceptual item of information; as anticipated, the strategic-mission index correlated negatively with current market share (Pearson $r = -.23$, $p < .05$ one-tailed test). In addition, each respondent was asked to indicate the degree of importance attached by superiors to SBU performance on each of 12 performance dimensions on a 5-point Likert-type scale ranging from of little importance to extremely important. Responses were again consistent with expectations. Strategic mission correlated positively with the importance of sales growth (.57, $p < .001$), market share (.29, $p < .05$), new product development (.24, $p < .05$), and market development (.30, $p < .01$) but negatively with the importance of operating profits ($-.23$, $p < .05$).

To test for response consistency (a surrogate for internal reliability), I asked respondents to indicate whether they expected the market share of their SBUs' principal products to decline rapidly ($=1$), decline slowly ($=2$), remain at the current level ($=3$), increase slowly ($=4$), or increase rapidly ($=5$). As anticipated, the strategic-mission index correlated positively with expectations of an increase in market share ($r = .49$, $p < .001$).

Competitive strategy. Using a 5-point scale ranging from significantly lower to significantly higher, respondents were asked to position their products relative to industry competitors in terms of performance and price. The sum of responses provided a measure of each SBU's competitive strategy with high values indicating differentiation and low values indicating low cost ($\alpha = .61$). Tested for construct validity, the competitive-strategy index correlated positively with the importance of new product development (.24, $p < .05$), market development (.32, $p < .01$), and research and development (.24, $p < .05$) but negatively with the importance of cost reduction programs ($-.17$, $p < .10$).

Openness in corporate-SBU relations. The variable was measured with a 4-item scale for the following items: (1) I would characterize my relationship with my boss as quite informal, (2) I feel quite free to call my boss when and as often as I like, (3) I never let my hair down in front of my boss, and (4) my boss and I have an open relationship. Respondents indicated whether they definitely agreed ($=1$), were inclined to agree ($=2$), were inclined to disagree ($=3$), or definitely disagreed ($=4$). The measure was a straight average of the responses to the four statements, with item 3 reverse-scored; high values indicated an open relationship. Values ranged from 1.75 to 4.00, with a mean of 3.15 ($\alpha = .76$).

Subjectivity in performance assessment. Respondents indicated whether superiors relied totally on a formula-based or a subjective approach, or on a combination approach, indicating, in the last case, the percentage of total bonus determined via a subjective approach. Values ranged from 0 (totally formula-based) to 100 (totally subjective), with a mean of 26.81.

Corporate-SBU decentralization. This variable was measured through two questions both patterned after Tannenbaum (1968). The first concerned the influence of SBUs' managers and

their corporate superiors, both line and staff, on the formulation of business units' long-range strategic plans; the second sought similar data for the formulation of business units' annual operating budgets. For each question, I divided an SBU manager's influence by superiors' influence and averaged the ratios; high values indicated greater decentralization. Values ranged from 0.60 to 4.38, with a mean of 1.86 (α = .77).

SBU's effectiveness. Data were collected on sales growth rate, market share, operating profits, profit to sales ratio, cash flow from operations, return on investment, new product development, market development, R&D activities, cost reduction programs, personnel development, and political/public affairs. Respondents rated an SBU's performance on each dimension relative to superiors' expectations on a 5-point scale ranging from not at all satisfactory to outstanding. Using the data on dimensional importance—obtained earlier for validating the strategic-context variables—as weights, I obtained a weighted-average effectiveness index for each SBU. Values ranged from 1.46 to 4.80, with a mean of 3.21, indicating that as a group respondents appear not to have inflated their reported performance. Heneman (1974) reported very high correlations between superiors and self-ratings when subordinates are guaranteed anonymity and understand that the objective of data collection is scientific and not evaluative, conditions that were met fully in this study.

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OBJECTIVE AND SOCIAL FACTORS
AS DETERMINANTS OF TASK PERCEPTIONS
AND RESPONSES: AN INTEGRATED
PERSPECTIVE AND EMPIRICAL INVESTIGATION

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The purpose of this study was to test the merits of an integrated perspective derived from the job characteristics and social information processing models of task design. We conducted a complex laboratory study, manipulating objective properties of a task, social information, and changes in both. Results suggested strong support for the integrated perspective. Implications for future theory and research are discussed.

Over the last two decades, the study of the design of work has come to occupy a prominent position in organizational science. Building on pioneering work of Turner and Lawrence (1965), Hulin and Blood (1968), and Hackman and Lawler (1971), researchers concerned with task design have focused considerable attention on the formation of perceptions of tasks and the relationships between those perceptions and various affective and behavioral responses. Moreover, issues of task design continue to be addressed frequently in the pages of organizational science journals.

At present there are two countervailing theoretical perspectives dominating the area. One perspective, which has grown from the research just cited, is usually referred to as the job characteristics model. The model suggests that objective facets or attributes of individuals' jobs primarily determine their perceptions of and responses to tasks (Hackman & Oldham, 1976). In the alternative perspective, presented by Salancik and Pfeffer (1978), task perceptions and attitudes are instead socially constructed realities that evolve from informational cues in workplaces. This perspective is generally called the social information processing model. The purpose of the study reported

here was to propose and test the efficacy of an integrated perspective derived from the two existing theoretical frameworks.

REVIEW OF THE LITERATURE

Several comprehensive reviews of the literature germane to each of the two dominant perspectives are readily available. For example, Griffin (1982), Hackman and Oldham (1980), and Roberts and Glick (1981) reviewed the literature concerning the job characteristics approach. Similarly, Blau and Katerberg (1982) and Thomas and Griffin (1983) reviewed the literature on social information processing. The following reviews are intended to summarize only the most salient aspects of each model in order to form a sound basis for discussing the integrated perspective.

The Job Characteristics Model

Proponents of the job characteristics model assume that jobs can be described in terms of a set of predetermined objective attributes, dimensions, or characteristics. As noted, this school of thought grew from three studies (Hackman & Lawler, 1971; Hulin & Blood, 1968; Turner & Lawrence, 1965). Hackman and Oldham (1976, 1980) codified this view into what they call the Job Characteristics Theory.

This theory suggests that five core dimensions—skill variety, task identity, task significance, autonomy, and feedback—can adequately describe and characterize jobs. The theory presumes that high objective levels of those dimensions of jobs lead to high levels of satisfaction, motivation, and performance, and to low levels of absenteeism and turnover among employees. Differences among individuals are also presumed to influence the general pattern of relationships between the dimensions and outcomes.

The standard approach to testing various aspects of the theory has been to measure incumbents' perceptions of the five core dimensions and then to relate those perceptions to the various outcome measures statistically. To date, researchers have tested the theory—or at least parts of it—in laboratory experiments (Umstot, Bell, & Mitchell, 1976), field surveys (Hackman & Oldham, 1976), and field experiments (Orpen, 1979). Most studies have found results generally supportive of the theory, although results involving performance as an outcome variable have been inconsistently supportive (Griffin, Welsh, & Moorhead, 1981).

In recent years, however, the job characteristics theory and the theoretical tradition it represents have come under attack on a number of fronts. Aldag, Barr, and Brief (1981) cited measurement deficiencies. Roberts and Glick reviewed numerous studies employing the job characteristics approach and concluded that "there are substantial inconsistencies in the task design area across the theory, operationalizations, analyses, and interpretations" (1981: 211) represented by these studies. They also advised that greater attention be paid to theoretical development and the design of studies.

The Social Information Processing Model

At least partially in response to this emerging body of criticism of job characteristics theory, Salancik and Pfeffer (1978) presented the social information processing model as an alternative view. Pfeffer provided perhaps the best summary of the model:

> First, the individual's social environment may provide cues as to which dimensions might be used to characterize the work environment. . . . Second, the social environment may provide information concerning how the individual should weight the various dimensions—whether autonomy is more or less important than variety of skill, whether pay is more or less important than social usefulness or worth. Third, the social context provides cues concerning how others have come to evaluate the work environment on each of the selected dimensions. . . . And fourth, it is possible that the social context provides direct evaluation of the work setting along positive or negative dimensions, leaving it to the individual to construct a rationale to make sense of the generally shared affective reactions (1981: 10).

Hence, proponents of the social information processing model assume that perceptions of and affect toward tasks are at least partially a function of social cues in workplaces.

The initial presentation of the model sparked a great deal of enthusiasm and research. The typical design of the first studies—generally conducted in laboratories—involved varying both objective task properties and the content of social cues provided by other fictional workers (O'Connor & Barrett, 1980; O'Reilly & Caldwell, 1979; Weiss & Shaw, 1979; White & Mitchell, 1979). In general, the authors of those studies concluded that social cues played a major role in shaping perceptions of or attitudes about tasks.

Cross-sectional field surveys (Oldham & Miller, 1979; O'Reilly, Parlette, & Bloom, 1980) have also provided at least indirect support for this perspective. In addition, Griffin (1983) tested the social information processing model in a field experiment. He trained first-line supervisors to provide positive social cues to their subordinates about their jobs, compared the effects of those cues on task perceptions and attitudes with the effects of objective task changes, and analyzed the interactive effects of the cues and changes. Results indicated that the social cues were just as powerful as the objective changes in altering perceptions and attitudes.

As occurred with the job characteristics model, however, criticisms of the social information processing model have recently begun to emerge (Blau & Katerberg, 1982; Thomas & Griffin, 1983). One criticism is that investigators have more clearly demonstrated effects supporting the model in laboratory studies than in field studies; a second is that there are still many unanswered questions as to the processes involved in the construction of social reality. For example, Thomas and Griffin noted that "none of the 10 studies serves even minimally to refute the task attributes [job characteristics] view. Further, none of the 10 studies provides specific and exact support for the SIP [social information processing] framework. In fact, the majority of the

research reviewed here offers more support for an overlapping viewpoint than for either of the other models" (1983: 679). Thus, there is a clear need for both theoretical articulation and empirical assessment of alternative viewpoints that incorporate elements of both the job characteristics and social information processing perspectives.

AN INTEGRATED PERSPECTIVE

As a starting point in developing an integrated perspective on perceptions of tasks and reactions to them, it is instructive to examine selected earlier studies in more detail. First, we will consider some of the initial job characteristics studies with social implications. Hackman and Lawler (1971), for example, implicitly recognized the importance of interpersonal relationships in organizations. Although most subsequent studies have focused on the so-called core dimensions like autonomy and variety, the original formulation also included a dimension labeled "friendship opportunities" and another called "dealing with others"; clearly, it did not altogether ignore social processes.

Bishop and Hill (1971) conducted a field experiment to determine the effects of objective job changes. An unexpected finding was that satisfaction declined for a group of workers whose jobs were not changed. Hence, some set of forces beyond the objective task conditions was evidently operative. In a reanalysis of Hackman and Oldham's (1976) original data, Oldham and Miller (1979) found that individuals reported relatively low levels of satisfaction if they perceived their jobs to be less complex than those of comparison others' jobs. A direct test of the implications of those findings (Oldham, Nottenburg, Kassner, Ferris, Fedor, & Masters, 1982) found that 75 percent of the participating employees used referents to make job comparisons. Thus, even studies undertaken from the job characteristics perspective have either directly or indirectly reflected the role of social processes in the formation of perceptions of tasks and reactions to them.

An analysis of selected studies based on the social information processing approach is equally enlightening. In one of the first of those studies, for example, White and Mitchell concluded that "employee perceptions . . . are a joint function of objective task characteristics and social cues" (1979: 8). Although the strongest effects that O'Reilly and Caldwell (1979) found were for social cues, objective properties of tasks also affected task perceptions and satisfaction. Weiss and Shaw (1979) reported similar findings. Even in the light of those equivocal results, however, many theorists have placed increased credence in the social information processing view and continued to question the efficacy of the job characteristics perspective. For example, O'Reilly and Caldwell argued that "The present study raises the question of the extent to which objective task characteristics make a difference or if, as suggested by Salancik and Pfeffer (1978), job characteristics are socially constructed realities" (1979: 163).

The one reported field experiment testing the social information processing model (Griffin, 1983) also provided equivocal support for the relative

merits of the two models. In that study, changes in social cues and objective
job changes were each found to have main effects on individuals' task percep-
tions and satisfaction. There were also several significant interactions be-
tween the two types of changes. Productivity was clearly affected by one
manipulation—objective changes—but not the other. It appears that studies
developed with the goal of testing the social information processing model
have generally produced support for the job characteristics model as well.

Recently, Glick, Jenkins, and Gupta (1986) designed and conducted a
study specifically to assess the effects of objective job characteristics and
social information on attitudinal outcomes. Although not based on an
experiment, their findings provided strong support for the position that both
objective properties of tasks and social information are important. Specifically,
they reported that objective characteristics were related to effort, but that
effects of social information inflated relationships among job characteristics
and affective outcomes.

The conclusions of researchers seeking to validate the social information
processing model notwithstanding, it appears that perceptions of tasks are,
in fact, partially determined by their objective properties and partially deter-
mined by social cues in workplaces. Although previous research supports
that conclusion, the literature suggests that scholars have not generally ac-
cepted it. Indeed, most researchers still tend to refer to the two theories as
separate viewpoints or approaches and to ignore their complementarity.

Clearly, then, there is need for (1) an integrated perspective that includes
both objective and social determinants of task perceptions and (2) research
to assess the efficacy of that perspective. Existing research has generally sup-
ported such an integrated perspective, but no study to date has directly
tested combinatorial effects in a systematic, experimental fashion. Table 1
displays predictions about task perceptions and satisfaction derived from an
integrated approach. A pure job characteristics view would posit main ef-
fects for job enrichment in terms of high or low objective levels of the five
core dimensions, and a pure social information processing approach would
posit main effects for positive or negative social cues. Taking an integrated
approach, we assumed that job enrichment and social cues work in a com-
pensatory and complementary fashion. We do not argue, of course, that the
effects will be expressed in some common metric. As Glick and colleagues
(1986) demonstrated, the potency of effects is likely to differ. Our point is
simply that job enrichment and social cues are likely to work together to
influence perceptions and attitudes.

It can further be argued that their influence should be detectable in both
static and dynamic settings. Static levels of job enrichment and social cues
should be related to static perceptions and attitudes, and changes in
enrichment, cues, or both could result in changes in perceptions and atti-
tudes. Thus, both the static and dynamic predictions listed in Table 1 are
appropriate.

Although previous studies have investigated some of the predicted
relationships, no study has systematically investigated all possible combina-

TABLE 1
Predictions of the Integrated Perspective

1. Enriched jobs and positive cues will lead to very high levels of positive perceptions of a task and satisfaction with it.
2. Enriched jobs and negative cues or unenriched jobs and positive cues will lead to intermediate levels of task perceptions and satisfaction.
3. Unenriched jobs and negative cues will lead to very low levels of task perceptions and satisfaction.
4. A change from an unenriched job and negative cues to a enriched job and positive cues will lead to a very positive change in task perceptions and satisfaction.
5. A change from an unenriched job and positive cues to an enriched job and positive cues or a change from an unenriched job and negative cues to an enriched job and negative cues will lead to a positive change in task perceptions and satisfaction.
6. A change from an unenriched job and positive cues to an enriched job and negative cues, a change from an enriched job and negative cues to an unenriched job and positive cues, or no change in the combination of an enriched or unenriched job and positive or negative cues will lead to no change in task perceptions and satisfaction.
7. A change from an enriched job and positive cues to an unenriched job and positive cues or a change from an enriched job and negative cues to an unenriched job and negative cues will lead to a negative change in task perceptions and satisfaction.
8. A change from an enriched job and positive cues to an unenriched job and negative cues will lead to a very negative change in task perceptions and satisfaction.

tions of relationships, and only one has considered the dimension of change (Griffin, 1983). More precisely, the literature contains no studies designed to assess the effects of: (1) changes from positive to negative job characteristics, (2) changes in social cues in either direction, and (3) systematic positive and negative changes in job characteristics in conjunction with complementary or contradictory changes in social cues. To address those issues, we examined various combinations of objective properties of a task and social cues and changes in both objective properties and social cues.

METHODS

Overview

The study manipulated two independent variables, the design of a task and social cues, as well as changes in those variables. Thus, each subject was exposed to either a change or no change in task and to either a change or no change in social cues.

The task consisted of processing real M.B.A. applications, using enriched or unenriched procedures. We obtained the applications from the M.B.A. office of a university; names were deleted to protect the individuals. We developed the basic task from the one described and used by O'Reilly and Caldwell (1979). Those experimenters, however, introduced no changes in either task conditions or social cues. Subjects in the present study worked on the task during two consecutive one-hour periods. In the first period, they used either the enriched or the unenriched procedures and in the second

period either switched to the alternative procedures or continued using their original procedures. Consequently, the objective task conditions consisted of the following four sequential combinations: enriched-enriched, unenriched-unenriched, enriched-unenriched, and unenriched-enriched.

Subjects received positive or negative social cues in both verbal and written forms at the beginning of both work periods. Thus, the social cues were of the following four sequential combinations: positive-positive, negative-negative, positive-negative, and negative-positive. The combinations of task design and social cue sequences result in a 4×4 factorial design. For reasons to be explained in the section on design of the main study, the design was not fully crossed.

Dependent variables were measured through items on questionnaires completed twice by all subjects, once after each of the work periods. Hence, we could assess final perceptions of the task and affective reactions as well as changes in those responses as a function of changes in the task and in social cues.

Pretest

A laboratory pretest was conducted in order to determine whether people perceived the two procedures developed for processing applications in the two task conditions as enriched and unenriched. The enriched procedures were designed to maximize the task dimensions of identity, significance, skill variety, autonomy, and feedback, and the unenriched procedures were designed to minimize the same task dimensions. We provided no social cues in the pretest.

Task variety. Subjects in both conditions coded information from applications onto coding sheets; the information was the same for both. Subjects in the enriched condition also read and evaluated essays by applicants, transcripts of grades, and letters of recommendation. Finally, they made recommendations concerning the admittance of the applicants. Consequently, performing the enriched procedures required the use of analytical and judgmental skills, but performing the unenriched procedures required little skill and judgment.

Task autonomy. Subjects in the enriched condition received few rules and guidelines concerning the evaluation and admittance of applicants. Experimenters recommended a standard, but they were allowed to use their own judgment in deciding whether to adhere to it. Because there were few guidelines, subjects had a great deal of autonomy in processing the applications. In the unenriched condition, subjects received specific rules and guidelines to follow in coding information. There was no opportunity for independent judgment.

Task feedback. Subjects in the enriched condition coded information for each applicant on a separate coding sheet and placed each completed sheet in a pile, a requirement that facilitated visualization of their progress and completed work. In the unenriched condition, subjects coded all applica-

tions on one coding sheet. Thus, it was more difficult for them to visualize the volume of their completed work.

Task identity. Subjects in the enriched condition evaluated an application and made one of the following recommendations: admit unconditionally, admit on probation, or reject. Thus, a determination of the status of an applicant identified the completion of the task. However, those in the unenriched condition were told that their job was a part of the process of evaluating the applications, that the coded information would be entered into a computer, and that others would make final recommendations concerning the applicants.

Task significance. Since subjects in the enriched condition were required to make recommendations concerning the admittance of students into the M.B.A. program, it was evident that their decisions would have a strong effect on the lives of others—the applicants. In the unenriched condition, subjects had no indication that their work would have a significant effect on the applicants' lives because others would make the final decisions.

Pretest subjects and procedures. The pretest employed 40 undergraduate students recruited from business classes at a large university in the Southwest, each of whom received $5 for an hour's time. We randomly assigned them to one of the two task conditions. They worked individually in a large room. Before performing the task, subjects heard explanations of the procedures corresponding to their task condition. After working on the task for 45 minutes, they completed a questionnaire measuring task perceptions and affective responses.

Measures. Subjects' specific perceptions of their task were measured by the Job Diagnostic Survey (JDS) (Hackman & Oldham, 1975). The JDS assesses individuals' perceptions of their task in terms of a motivating potential score (MPS). A low MPS indicates a task is relatively unenriched, while a high MPS suggests that the task is relatively enriched. We also used a semantic differential scale (Scott, 1967) to measure perceptions. The scale included twenty-five 7-point items anchored by contrasting adjective pairs; explicit to vague, varied to routine, and structured to unstructured are examples. Our rationale for including this measure stemmed from the basic assumptions of the social information processing viewpoint: if individuals' definitions and evaluations of relevant task dimensions may vary, experimenters should give subjects a wide array of response opportunities. Hence, it seemed appropriate to include an additional assessment scheme, using a different but reliable psychometric instrument, to gain as complete as possible a picture of subjects' impressions of the task and to broaden the generalizability of findings.

Affective responses were measured with the short version of the Minnesota Satisfaction Questionnaire (MSQ) (Weiss, Davis, England, & Lofquist, 1967). The MSQ is a 20-item instrument providing indexes of intrinsic, extrinsic, and overall satisfaction. We devised an additional 5-item measure as a specific index of satisfaction with the job. The items were (1) this job was interesting and challenging; (2) this job did not give me a feeling of

TABLE 2
Means, Standard Deviations, Reliabilities, and Differences in Means for the Laboratory Pretest

Variables	Total Population			Differences Between Groups		
	Means	Standard Deviations	α	Enriched Task Means	Unenriched Task Means	F
Task variety	2.15	1.13	.51	2.85	1.45	24.33***
Task autonomy	3.55	1.80	.75	5.02	2.08	80.69***
Task feedback	4.92	1.03	.49	5.28	4.55	5.62*
Task identity	4.19	1.55	.49	4.87	3.52	9.12**
Task significance	1.62	1.79	.82	2.63	0.60	18.68***
Motivating potential score	57.09	47.32		94.47	19.71	67.51***
Semantic differential	3.78	1.25	.91	4.46	3.11	16.18***
Intrinsic satisfaction	2.98	0.82	.90	3.50	2.45	28.51***
Extrinsic satisfaction	3.09	0.55	.74	3.08	3.10	0.01
Overall satisfaction	3.07	0.63	.90	3.40	2.75	14.41***
Job satisfaction	2.79	1.06	.91	3.44	2.13	24.49***

$* p < .05$
$** p < .01$
$*** p < .001$
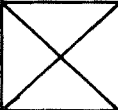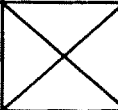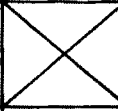
accomplishment, (reverse-scored); (3) on balance, I was satisfied with doing this job; (4) considering all things that are important to me, I really liked this job; and (5) this job was fun to do. Responses to both the MSQ and job satisfaction measures were on 5-point scales.

Results of pretest. Table 2 provides the variables' means, standard deviations, and reliability estimates (α) for the total pretest group. Because the results of the multivariate F-test were significant beyond the .001 level, we also give results of univariate F-tests in Table 2. The means for all task dimensions were significantly higher for subjects in the enriched task condition. The differences between the two groups were also significant on all dimensions except extrinsic satisfaction. The fact that external rewards were the same for all subjects probably accounts for the lack of a significant effect for extrinsic satisfaction. Thus, the results clearly demonstrate that the procedures developed for processing M.B.A. applications in the two task conditions had significantly different influences on perceptions of the task and affective responses to it.

Experimental Design

Figure 1 summarizes the design of the main study. We did not use four cells of the experimental design because there was a contradiction inherent in having the same information source provide both positive and negative social cues when task procedures remained the same for both work periods. Experimenters could not reverse their statements about the job in a convinc-

FIGURE 1
Experimental Design

. Cue Sequences[a]

		− +	+ +	− −	+ −
	− +	1	2	3	4
	+ +	✕	5	6	✕
Task Sequences[b]					
	− −	✕	7	8	✕
	+ −	9	10	11	12

[a]−designates negative cue; + designates positive cue.
[b]−designates unenriched; + designates enriched.

ing and realistic way when the task did not change. Thus, we blocked such unrealistic combinations out of the design and took the absence of responses in those cells into consideration in the data analyses.

Subjects and Procedures

Subjects were 200 undergraduate business students at a large university in the Southwest. They voluntarily participated in the experiment and were paid for their time. Subjects reported to a learning laboratory in groups that ranged in size from two to six persons. We randomly assigned each group to one of the experimental conditions. Subjects were told that the purpose of the study was to examine one or more sets of procedures used in processing M.B.A. applications. Individuals worked alone, seated in a large room with the others in their group.

One of two graduate students, either a man or a woman, was randomly assigned to conduct each laboratory session. After stating the purpose of the study, the experimenters described either the enriched or unenriched procedures, whichever corresponded to a group's experimental condition. Subjects then read a general written description of the job that contained either positive or negative social cues, whichever matched their experimental condition, concerning the nature of the task. In addition, experimenters gave them a list of fictitious statements containing positive or negative cues about the nature of the task, telling subjects that others who had worked on

the task had made the statements. After subjects had read both a description and a set of statements, experimenters read scripts that provided positive or negative verbal cues concerning the general nature of the task. The written and verbal cues provided during a given work session were consistent—either all positive or all negative. Texts of the descriptions, of the scripts read by experimenters to manipulate cues, and of the fictitious statements about the job appear in the Appendix.

Subjects worked on the task for 45 minutes with an experimenter present in the room. At the end of the work period, subjects completed a questionnaire, basing their answers on the task that they had been performing. Next, subjects either performed the task using the other procedures or continued to use their original procedures. Experimenters provided subjects in the no-change conditions with additional verbal cues consistent with the original cues they had received and requested that they continue working on the task for another 45 minutes. At the end of the period, subjects again completed the questionnaire.

For the conditions in which subjects experienced a change in task procedures, experimenters explained the new procedures, giving as the rationale for the change a need to examine alternative methods of processing applications. Subjects read another description of the job and other statements containing either positive or negative cues. Experimenters also provided additional verbal cues concerning the nature of the task. The Appendix shows how manipulations were used in the second work period. Subjects worked on the task using the second procedures for 45 minutes, at the end of which they, too, again completed the questionnaire, basing their answers on performing the task using the second procedures. For data analysis, we designated the administrations of the questionnaire at the end of the two work periods as time 1 and time 2.

At the end of the second work period, subjects signed a form confirming their participation in the experiment. They then received $10 in cash for their two hours of involvement in the study. All who were interested were debriefed as a group at the conclusion of the study.

Manipulations

Task design. The task enrichment manipulation was created by the procedures used in processing the applications. We designed the task procedures for the enriched condition to maximize the dimensions of task variety, autonomy, feedback, identity, and significance. For the unenriched condition, the procedures minimized the same task dimensions. The procedures were precisely those validated in the pretest.

A conceptual issue, of course, is the extent to which the two activities are different versions of the same task or two different tasks altogether. Herzberg used responses to the question, "But did it change the work itself?" (Hackman & Oldham, 1980: 57) to determine if an intervention actually enriched a job. An affirmative answer indicated that enrichment occurred. Hackman and Oldham (1980) defined enrichment as so altering a task that it

includes more motivating properties than it originally did. In fact, in a classic case study of failure to enrich a job, Frank and Hackman (1975) attributed a lack of results to lack of change in the job.

In describing how to enrich jobs, Herzberg (1968) identified two processes that are relevant for this study. The first is to grant additional authority to an employee, and the second is to introduce new and more difficult tasks into the job. Hackman and Oldham (1980) advised combining tasks performed by several people so that one individual performs all the tasks needed to complete a process. They also advised vertical loading, or the pushing down of tasks usually reserved for higher levels of management. One example of this would be encouraging employees to seek solutions to problems on their own. It is logical to assume that such alterations in a process would somewhat change the form, but not the purpose, of work outcomes. In other words, an enriched task must satisfy the same organizational needs that it always has, but alterations and additions may raise the actual end product of the job beyond its initial level.

Such ought to be the case with the variations of the task used in our study. O'Reilly and Caldwell (1979) designed the enriched and unenriched versions to differ as much as possible yet still seem to be the same job. Both our variations involved processing M.B.A. applications and had a common purpose—assisting in the selection of candidates. The two activities used identical equipment, both involving the codification of application information onto data entry sheets for a computer. The outcomes for the two conditions were also similar. Subjects produced information in a useful form that some unknown superior would use in making an actual decision. The two differed in that subjects in the unenriched condition only did some simple data coding, and subjects in the enriched condition did some relatively complex information processing (reading and interpretation) and made an advisory judgment before coding the data. Thus, the activities served the same purpose; the outputs were simply in different forms.

Social cues. The social manipulation consisted of positive and negative cues concerning specific task dimensions and the general nature of the task. The cues, provided at the beginning of both work periods, were delivered in three forms: written descriptions of the job, written evaluations allegedly by others who had done the task, and verbal statements from the experimenters.

An example of a positive cue in a written description of the job for the enriched conditions was "The task is interesting, pertinent, and challenging." A negative cue in a description for the same conditions was "Unfortunately, the process is vague and difficult." A positive cue in a description of the job for the unenriched conditions was "The task is easy and very straightforward so you don't have to worry about whether you're doing the job correctly or not." On the other hand, a negative cue in a description for the same conditions was "Unfortunately, the task is nothing more than a routine clerical task."

An example of a positive cue from the written evaluations for the enriched conditions was "I really enjoyed working on this task. Because I was

required to do many different things, I found the job very challenging." A sample negative cue for the same conditions was "I really did not enjoy doing this task. Because I was required to do many different things, I found the job very confusing and difficult." For the unenriched conditions, a positive cue was "This job was easy to do and did not involve a great deal of concentration. Consequently, I enjoyed working on the task." An example of a negative cue was "The task was very repetitive and very dull. I did not like it at all."

An example of a positive verbal cue provided by an experimenter for the enriched conditions was "I think you'll like doing this job. You get to do several different things, and you get to choose how you do them." On the other hand, a negative verbal cue for the same conditions was "Unfortunately, this job is very vague. There does not appear to be much direction or purpose to it." A positive verbal cue for the unenriched conditions was "I think you will enjoy doing the job. The procedure is straightforward and specific." Finally, a negative verbal cue for the same conditions was "Unfortunately, I don't think you'll enjoy doing the job using this procedure. This way of doing the job is very straightforward and you don't get to exercise any creativity."

Measures

Three categories of outcome variables were measured via the questionnaire administered at the end of each work period: specific task perceptions, general task perceptions, and affective reactions. They were respectively measured with the JDS (Hackman & Oldham, 1975), a semantic differential scale (Scott, 1967), and the MSQ and the 5-item job satisfaction scale that we wrote. We described the scales and demonstrated their appropriateness in our discussion of the experimental pretest.

RESULTS

Table 3 shows the intercorrelations among the dependent variables at the two measurement times, as well as their test-retest reliabilities. The test-retest correlations shown in the table reflect only those conditions where no changes were introduced in experimental condition. Static reliability estimates (α) were all satisfactory, with a low value of .68 for extrinsic satisfaction at time 1. Table 4 shows means and standard deviations. Cells contained either 16 or 17 individuals.

A pattern of intercorrelations like this one would ordinarily suggest using a MANOVA for data analysis. However, the incomplete design precluded a straightforward 4 × 4 analysis. To partially compensate for this, we performed several MANOVAs on different subsets of the cells, choosing each subset to reflect a design theoretically defensible on its own merits. The analyses did not specifically refer back to the predictions in Table 1 but instead focused on dominant main effects of changes in the task and cues, cue changes controlling for task differences, and task changes controlling for cue differences.

TABLE 3
Intercorrelations Among the Dependent Variables

Time 2	Time 1			
	MPS[a]	Semantic Differential	Overall Satisfaction	Job Satisfaction
MPS[b]	(−.06)	.46	.50	.61
Semantic differential	.67	(.23)	.39	.50
Overall satisfaction	.71	.76	(.31)	.69
Job satisfaction	.72	.79	.80	(.23)

[a] Test-retest reliabilities for no-change conditions are in parentheses.
[b] MPS represents motivating potential score.
[c] All correlations above .20 are significant at $p < .001$.

The subsets were (1) cells 1, 4, 9, and 12, employed in a 2 × 2 design comparing only those cells in which both task and cues changed from time 1 to time 2; (2) cells 2, 3, 5, 6, 7, 8, 10, and 11, in a 4 × 2 design combining changed cues with all task sequences; and (3) cells 1, 2, 3, 4, 9, 10, 11, and 12, in a 2 × 4 design combining the two changing task sequences with all possible cue sequences. Results of the analyses provided clear and consistent support for the integrated perspective. The pattern of mean differences for the main effects for cue and task were universally consistent with the nature of the procedures and cues to which subjects were exposed. Tables summarizing these results are available from the authors.

To more clearly assess the relative efficacy of the model, we conducted a final and somewhat unconventional analysis. It involved predicting relative levels of the dependent variables for different sets of cells and then investigating mean differences across sets to test the predicted differences. The predictions, derived from Table 1, included levels at time 1 and time 2, and changes from time 1 to time 2. Results of the three multivariate F-tests for time 1, time 2, and the changes were all significant beyond the .001 level. More detailed results are available from the authors.

Table 5 summarizes the results of the subsequent univariate F-tests. The predictions for the integrated model are complex and refined; the model predicts three levels for each variable within time points and five gradations of change. For instance, we predicted that at time 1 the enriched job with positive cues (cells 5, 10, and 12) would reflect very high levels, the enriched job with negative cues or the unenriched job with positive cues (cells 2, 4, 6, 7, 9, and 11) would reflect intermediate levels, and the unenriched job with negative cues (cells 1, 3, and 8) would reflect very low levels. All patterns of differences in means are significant ($p < .001$) and are in the directions predicted. The results of the analysis provide clear and consistent support for the integrated model.

TABLE 4
Cell Means and Standard Deviations of Dependent Variables

Task Sequence / Dependent Variables	Negative/Positive Cues (t₁) Means	s.d.	(t₂) Means	s.d.	Positive/Positive Cues (t₁) Means	s.d.	(t₂) Means	s.d.	Negative/Negative Cues (t₁) Means	s.d.	(t₂) Means	s.d.	Positive/Negative Cues (t₁) Means	s.d.	(t₂) Means	s.d.
Unenriched/enriched																
MPS[a]	11.49	7.64	101.83	50.44	30.13	42.76	110.40	49.62	9.31	17.32	37.77	30.70	20.00	16.02	99.84	57.21
Semantic differential	3.35	0.54	4.67	1.04	3.92	0.57	4.77	0.40	2.88	0.92	3.00	1.19	3.99	1.11	4.51	0.70
Overall satisfaction	2.53	0.41	3.46	0.48	2.92	0.52	3.54	0.32	2.62	0.55	2.70	0.52	3.33	0.46	3.54	0.37
Job satisfaction	1.93	0.40	3.56	0.77	2.72	0.74	3.93	0.69	1.81	0.67	2.09	1.02	3.22	0.82	3.46	0.88
Enriched/enriched																
MPS					90.37	46.11	93.44	46.22	46.13	32.34	36.78	28.33				
Semantic differential					4.55	0.91	4.61	0.61	3.83	0.54	3.62	0.83				
Overall satisfaction					3.70	0.29	3.67	0.35	3.38	0.54	3.26	0.52				
Job satisfaction					3.68	0.62	3.59	0.60	2.60	0.89	2.63	1.10				
Unenriched/unenriched																
MPS					21.94	21.66	17.69	14.16	8.34	9.86	16.29	23.13				
Semantic differential					3.45	1.46	4.05	0.61	3.29	0.55	3.21	0.57				
Overall satisfaction					3.07	0.50	3.01	0.51	2.62	0.47	3.59	0.59				
Job satisfaction					2.75	0.88	2.68	1.05	1.87	0.67	1.95	0.90				
Enriched/unenriched																
MPS					92.99	50.97	14.09	12.85	50.66	41.18	6.76	7.92	96.17	56.84	11.39	12.72
Semantic differential					5.00	0.48	3.89	0.77	3.67	1.12	3.45	0.55	4.03	1.59	3.10	0.93
Overall satisfaction					3.58	0.30	2.80	0.53	3.24	0.47	2.57	0.36	3.47	0.40	2.51	0.40
Job satisfaction					3.91	0.53	2.42	0.82	2.71	0.71	1.65	0.75	3.49	0.80	1.92	0.73

[a] MPS represents the motivating potential score.

TABLE 5
Predictions of the Integrated Perspective and Average Cell Means[a]

(a) Time 1

Dependent Variables	Very High Levels (Cells 5, 10, 12)	Intermediate Levels (Cells 2, 4, 6, 7, 9, 11)	Very Low Levels (Cells 1, 3, 8)
MPS[b]	93.32	33.87	9.79
Semantic differential	4.52	3.68	3.17
Overall satisfaction	3.58	3.21	2.59
Job satisfaction	3.69	2.83	1.87

(b) Time 2

Dependent Variables	Very High Levels (Cells 1, 2, 5)	Intermediate Levels (Cells 3, 4, 6, 7, 9, 10)	Very Low Levels (Cells 8, 11, 12)
MPS[b]	102.23	38.74	17.88
Semantic differential	4.68	3.82	3.37
Overall satisfaction	3.55	2.96	2.76
Job satisfaction	3.69	2.61	2.06

(c) Change (T2–T1)

Dependent Variables	Large Net Increase (Cell 1)	Net Increase (Cells 2, 3)	No Change (Cells 4, 5, 6, 7, 8, 9)	Net Decrease (Cells 10,11)	Large Net Decrease (Cell 12)
MPS[b]	90.34	53.63	9.28	−62.50	−84.77
Semantic differential	1.32	0.47	0.20	− 0.69	− 0.93
Overall satisfaction	0.93	0.34	−0.06	− 0.73	− 0.97
Job satisfaction	1.62	0.73	−0.03	− 1.28	− 1.57

[a] $p < .001$ for all variables at time 1, time 2, and change scores.
[b] MPS represents the motivating potential score.

DISCUSSION

This study investigated the merits of a general, integrated perspective on perceptions of tasks and responses to them. Taking such a perspective, we suggested that objective facets of workplaces and social information jointly determine perceptions and affect. Results provided strong support for this general integrated perspective. However, like most research in the social sciences, this study had a number of strengths and weaknesses that we should delineate before drawing implications.

Two strengths in particular characterize the study. First, manipulating both objective job characteristics and social information in a laboratory setting made it possible to tightly control the frequency and magnitude of information from both the task itself and social sources. We took great care to provide an adequate test of the model through valid manipulations of all information sources. Second, by focusing on *changes* in both objective job characteristics and social information, the study provided a more powerful

test of effects on responses to information about a task than previous studies have included. Compared to the static designs typical in comparable research, our experimental design allowed a more accurate representation and analysis of the dynamic processes surrounding task perceptions.

Unfortunately, these strengths are coupled to the greatest weakness of the study. As an artificial work environment, the laboratory setting was characterized by demand characteristics and other possible threats to validity. In addition, the design was not fully crossed, thereby weakening the power of the experimental test. Finally, the lack of a common metric to assess the differential and relative strengths of the effects of task and social cues is another limitation.

Nonetheless, the power provided by the experimental control and certain inferences allowable from the changes in each independent variable let us identify some important points about the formation of task perceptions and attitudes. Of perhaps greatest significance is the clear and consistent support provided for the general integrated framework. Aside from one study (Glick et al., 1986), previous research has provided only partial, limited, or inferential support for an integrated perspective. This study, conceived and designed a priori to test for combinatorial effects, demonstrated those effects completely and directly. Taken with the work of Glick and colleagues, then, the results provide a meaningful integration of previous research and underscore both a need and a direction for future theoretical development and refinement.

The integrated framework's ability to predict fine gradations of both absolute outcomes and changes in outcomes and the empirical support accorded those predictions underscore the efficacy of the approach. Managers and organizations can benefit from the evidence that (1) task characteristics and social cues combine to affect people's reactions to jobs, and (2) introducing constructive changes in an existing work environment can produce those reactions. Most previous evidence has accumulated from research designs that introduced naive subjects to various static task environments without attempting to create or measure actual changes.

It is also instructive to note that the results of this study, designed to test an integrated approach, are in fact consistent with many of the results obtained in earlier studies focusing on either the job characteristics model or the social information processing model. In the lab studies cited in the beginning of this paper, for example, researchers found that both objective task properties and social information affected perceptions and reactions. Similarly, the one reported field experiment (Griffin, 1983) also found main effects for both sources of information as well as a number of interactions. The study reported here is in many ways the culmination of an evolving stream of research consistently demonstrating the joint effects of objective task properties and social information on individuals' perceptions of and reactions to tasks. This research stream can almost be considered serendipitous, in that the studies typically sought to investigate one model or the other rather than combinatorial effects. As in so many other literatures, the

pendulum has swung from one extreme point to another, from job characteristics to social information processing, and perhaps it will now come to rest at a middle point.

The next step is obvious: the formulation and specification of a unified theory of task design. The development of such a theory is beyond the scope of this study. However, the ideas and findings reported here may be useful in identifying the broader context in which a unified theory of task design might be based.

First, there needs to be a clear delineation of what is meant by "task." Proponents of the job characteristics approach conceptualize a task in terms of objective attributes of the job being performed by an incumbent. Although few researchers have acknowledged this difference, those advocating the social information processing model implicitly take a broader view of the meaning of task. For example, Salancik and Pfeffer used style of supervision and general working conditions as examples of "characteristics of the job or task" (1978: 227). Clearly, then, the precise delineation of the boundaries of the concept need to be explicated.

Second, there is need for clarification of the questions being addressed. Researchers adopting the job characteristics approach typically seek answers to the question, "How do different kinds of people respond to their perceptions of various objective job dimensions?" In contrast, those taking the social information processing approach attempt to answer the question, "How do people form perceptions of and responses to their jobs?"

After clarifying definitions and questions, researchers need to turn their attention to developing a unified theory of task design. At a minimum, such a theory should address the following issues: (1) sources of information in the formation of task perceptions, including the weighting, sequencing, and other processes involved in the assimilation of various kinds of information; (2) the processes involved in the construction of social realities; and (3) the direction and magnitude of effects between workplace perceptions, attitudes, and behavior. This study, for instance, provides some useful indicators about the first of those questions. Specifically, both social information and objective properties of the task influenced perceptions and attitudes. Positive social information enhanced the enriched procedures, but not the unenriched ones, and subjects favorably perceived changing from the unenriched to the enriched procedures.

Finally, of course, research in a variety of settings will be needed to confirm or deny various elements of a unified theory. Laboratory work seems useful for testing specific propositions but of limited long-term value for explaining processes of task design, unless it is supplemented by well-designed field research. Statistical assessments in the field should further be complemented by qualitative strategies like direct observation and participant observation. Such approaches should enrich the data acquired and enhance interpretative insight.

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APPENDIX
Written and Verbal Cues

Descriptions of Jobs

Unenriched task, negative cues (cells 1, 3, 8, 11, 12). The purpose of this task is to process real M.B.A. applications in order for a committee to make a recommendation concerning applicants' admittance into the program at Texas A&M. You will be coding information from applicants' forms to one sheet which will be processed by a computer. The computer output will be used by the committee to make a decision concerning admittance into the program. Unfortunately, the task is nothing more than a routine clerical task. It is very straightforward, with rigid, detailed procedures to be followed. Since you are able to process a large number of applications within a short period of time, the task becomes repetitive and boring.

Unenriched task, positive cues (cells 2, 4, 7, 9, 10). The purpose of this task is to process real M.B.A. applications in order for a committee to make a recommendation concerning applicants' admittance into the program at Texas A&M. You will be transferring specific information from applicants' forms to coding sheets which will be processed by a computer. The computer output will be used by the committee to make a decision concerning admittance into the program. The task is easy and very straightforward so you don't have to worry about whether you're doing the job correctly or not. The procedures have been made as clear and specific as possible. Basically, you will be doing a clerical task so you won't have to learn a large number of complex procedures. This task is designed so that applications can be processed accurately and easily.

Enriched task, positive cues (cells 1, 2, 5, 10, 12). The purpose of this task is to critically evaluate real M.B.A. applications in order to make a recommendation concerning applicants' admittance into the program at Texas A&M. You will be processing actual M.B.A. applications, transferring essential information onto coding forms, and providing an overall rating and recommendation for each applicant. The task is interesting, pertinent, and challenging. Some technical skills and a high level of motivation are required to do the task properly. This task is very important and has a strong impact on the quality and the reputation of the M.B.A. program at

Texas A&M. The College of Business has set the following admission standards: GMAT: 525 and GPA: 3.1.

Enriched task, negative cues (cells 3, 4, 6, 9, 11). The purpose of this task is to evaluate real M.B.A. applications in order to make a recommendation concerning applicants' admittance into the program at Texas A&M. You will be processing actual M.B.A. applications, transferring information onto coding forms, and providing an overall rating and recommendation for each applicant. Unfortunately, the process is vague and difficult. You will have to make many important decisions without having specific criteria to follow. Even though the task is rather ambiguous, it has a strong impact on the quality and the reputation of the M.B.A. program at Texas A&M. The College of Business has set the following admission standards: GMAT: 525 and GPA: 3.1.

Fictitious Written Evaluations from Other Participants

Unenriched task, negative cues (cells 1, 3, 8, 11, 12).

I really did not enjoy working on this task because it was very simple and boring. The procedures were too specific and did not allow for any creativity on my part. Boring and dull. Not much purpose to this, I felt like a human scantron sheet. Couldn't this job be computerized away?

I didn't like it. It was too simple and a waste of time. The task was very repetitive and very dull. I did not like it all. It gave me a feeling of what it would be like working on an assembly line.

I didn't enjoy working on this task at all. It was easy to learn how to do the task which made the job very boring after working on it for a short period of time.

I was glad when the job was finally completed—it was much too dull. The procedures were straightforward but the job became too repetitive.

Couldn't there have been a better way for you to spend your money? There was no point to this job, it was boring and stupid.

I couldn't figure out what it was that we were doing, or why we were doing what we were doing.

Unenriched task, positive cues (cells 2, 4, 7, 9, 10).

I enjoyed working on this task because the procedures were specified and easy to follow. The job was simple and I didn't have to learn to do a large number of tasks. The task was realistic—it gave a good idea of how graduate schools analyze student applications. It was very interesting.

I liked the job. It was straightforward and to the point. No confusion at all, and I knew exactly what to do.

I liked this job very much because it involved only a few procedures. Because there were fewer procedures, I was able to become very efficient at processing the applications. I thought the procedures were very clear; thus, I didn't have to worry about whether I was doing the task correctly or not.

This job was very easy to do and did not involve a great deal of concentration. Consequently, I enjoyed working on the task. The work was okay. I didn't get bored.

I liked it—it provided me with an idea of how schools process the information on applications. I learned what I should put on applications, and what is unnecessary. It was fairly straightforward, clear, easy. I thought it was an enjoyable task.

Enriched task, positive cues (cells 1, 2, 5, 10, 12).

I really enjoyed working on this task. Because I was required to do many different things I found the job very challenging. Additionally, I liked being responsible for determining how to go about completing the task.

I really liked the job. I thought it was very interesting. What was particularly good about doing this job was that I could do the analysis from beginning to end, and I worked on people I got to choose. I felt I was doing an important task.

I liked it—it provided me an idea of how to really evaluate student applications and what was good versus bad on applications.

It was okay. I didn't get bored.

I liked doing this job because it involved working on a lot of different tasks. This made the job more interesting. The time really went by fast.

I thought that the job was interesting because I was able to make decisions on my own without having to follow specific rules.

I enjoyed doing this job. It was fun. I thought it was realistic.

I liked the idea about letting us have the power to make evaluations. Students don't usually have the chance to show they have brains.

Enriched task, negative cues (cells 3, 4, 6, 9, 11).

I really did not enjoy doing this task. Because I was required to do many different things, I found the job very confusing and difficult. Additionally, I did not like having the responsibility for determining how to go about completing the task.

I didn't have the faintest idea what I was supposed to do—too confusing.

Not much point to this job, I was disappointed.

It would have been nice if we were told what we should have done.

I didn't know what exactly to do, and how I was doing what I was doing. You should be more specific.

I really don't know about this job. It was confusing and I never really knew if what I was doing was what we were supposed to be doing. I would have liked to have had more directions. An explanation of what you were looking at would have been very helpful.

I felt that the job did not have enough rules or procedures to follow. I felt that I had to make too many decisions concerning how to go about completing the task.

Overall, I felt that the job was too complex and confusing. I didn't know if I was doing the task correctly and there weren't many guidelines to follow.

What the hell did you want?

I really did not like working on this job at all. There were no clear procedures to follow and I had to make a lot of decisions on my own.

Verbal Scripts Used by Experimenters

Unenriched task, negative cues, time 1. [The purpose of this study is to examine two different procedures used in processing M.B.A. applications. Unfortunately, I don't think you'll enjoy doing the job using the first procedure. This] way of doing the job is very straightforward and you don't get to do a lot of different things. Like many jobs in the real world, there is no opportunity to use independent thoughts or actions. It's a dull, simple job. You basically will be doing the same thing over and over again and this does become tedious. Since the results won't become known until long after this part of the job is finished, you won't be able to tell if you've done a good job or not. Most people who have worked on this task found it to be very boring and repetitive as you can see from some of their written comments on the sheet.

To use the script for time 2, experimenters began with [Unfortunately, the second] rather than the bracketed words in the time 1 script.

Unenriched task, positive cues, time 1. [The purpose of this study is to examine two different procedures used in processing M.B.A. applications. I think you will enjoy doing the job using the first procedure.] This procedure is straightforward and specific. You also don't have to worry about doing several different things. Because this procedure is very clear, you can learn the job quickly without any frustration. Most people who have worked on this job using this procedure have found the task very enjoyable and easy, as you can see by their comments on the sheet. I'm sure you all will also enjoy working on this task using this procedure.

At time 2, experimenters substituted [I think you will enjoy doing the job using the second procedure] for the bracketed words above.

Enriched task, negative cues, time 1. [The purpose of this study is to examine two different procedures used in processing M.B.A. applications. Unfortunately, the first way of doing this job is very vague.] There does not appear to be much direction or purpose to it; however, this is typical of many jobs. It is not very concrete, so you might have some trouble in determining exactly how well you are performing the task. Some of you may also find that there are just too many things that should be done. Most people who have worked on this task found the procedures to be unclear and the task unenjoyable. As you can see by their written comments on the

sheet, individuals had some problems with doing this job. I want to apologize for the undesirable nature of this task.

At time 2, experimenters substituted [Unfortunately, I don't think you'll enjoy doing the job using the second procedure either. The second way of doing this job is very vague] for the words in brackets in the time 1 script.

Enriched task, positive cues, time 1. [The purpose of this study is to examine two different procedures used in processing M.B.A. applications. I think you'll like doing this job using the first procedure.] You get to do several different things, and you get to choose how you do them. You should find it very interesting. We've designed it to give you a maximum amount of freedom to use your own judgment and knowledge. It is one way which is used to analyze applications. There are also quite a number of different things that you will be doing which should hold your interest. Most people who have worked on this task found it enjoyable and interesting, as you can see by their comments on the sheet. I'm sure you all will also enjoy working on this task.

For use at time 2, experimenters said [I think you will also enjoy doing this using the second procedure] instead of the bracketed words above.

When there were no changes in the task or cues from time 1 to time 2 experimenters used these scripts:

Unenriched task, negative cues. I again want to apologize for the task being boring and repetitive. Unfortunately, the task is very tedious but does allow one to process a large number of applications. It is unfortunate that there is no challenge to doing this job.

Unenriched task, positive cues. I hope you all are enjoying working on this task. Because the procedures are very clear and straightforward, you don't have to worry about doing a lot of different things.

Enriched task, negative cues. I again want to apologize for the task being unclear and complex. Unfortunately, there are no specific procedures to follow and the standards used in evaluating the applications are not identified.

Enriched task, positive cues. I hope you all are enjoying working on this task. Because you have different things to do throughout the task, the job is much more interesting. You also get to make a lot of decisions on your own, using your own judgment. The task is very important and challenging.

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SHARED INFLUENCE AND ORGANIZATIONAL BEHAVIOR: A META-ANALYSIS OF SITUATIONAL VARIABLES EXPECTED TO MODERATE PARTICIPATION-OUTCOME RELATIONSHIPS

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This study is a meta-analysis of the effects of four situational moderators on relationships between participation and five outcomes. Results based on 118 correlation coefficients indicate that, with the influence of percept-percept research procedures controlled, group size, task interdependence, task complexity, and performance standards exert a few statistically significant moderating effects, and that participation typically has only modest influence on task performance, decision performance, motivation, satisfaction, and acceptance. Combined with evidence from another recent meta-analysis by Miller and Monge, the results suggest that methodological artifacts explain many of the noteworthy positive findings published in research on relationships between participation and its outcomes.

Participation, defined as joint decision making (Locke & Schweiger, 1979; Vroom, 1960) or as influence-sharing between hierarchical superiors and their subordinates (e.g., Mitchell, 1973), is a central topic of inquiry in the organizational sciences. As part of that inquiry, researchers have examined relationships between participation and outcomes such as task productivity, motivation, and satisfaction and have typically concluded that those relationships are at least moderately positive (e.g., Coch & French, 1948; Lawler, 1982; Strauss, 1963). However, that conclusion requires reconsideration in light of recent quantitative reviews that have given it mixed support. This study examines the evidence reported in those reviews and reassesses the strength of relationships between participation and several outcomes using a meta-analysis of published research performed in the United States.

EVIDENCE AND ISSUES IN QUANTITATIVE REVIEWS

Some quantitative reviews have reported findings that seem to support the existence of noteworthy participation-outcome relationships; others have not. In a study providing apparent support, Guzzo, Jette, and Katzell (1985)

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examined the efficacy of sociotechnical interventions in a meta-analysis of research on improving productivity. After correcting for sampling error and averaging d-statistic measures across studies, Guzzo and colleagues found that the productivity of workers involved in sociotechnical interventions was more than one-half standard deviation ($\bar{d} = .62$) greater than the productivity of comparison groups not exposed to sociotechnical programs. Since participative processes are a pervasive element of sociotechnical interventions (Herbst, 1976; Susman, 1976), those results seem to substantiate a positive relationship between participation and productivity.

Likewise, Miller and Monge (1986) reported apparently supportive evidence in a meta-analysis of 41 correlations between participation and satisfaction and 25 correlations between participation and productivity. After adjusting for sampling error and partially adjusting for measurement error, they found a mean correlation of .34 between participation and satisfaction and a mean correlation of .15 between participation and productivity. Subsequent moderator analyses identified conditions within which those relationships were even stronger. For instance, a participation-satisfaction correlation of .46 emerged when Miller and Monge averaged the results of studies conducted in organizational settings that incorporated perceptual measures of multiple-issue participation. Similarly, a participation-productivity correlation of .27 was revealed when they averaged the results of field studies lacking goal-setting interventions. Thus, Miller and Monge's findings substantiate a noteworthy positive relationship between participation and satisfaction. Their findings with respect to the relationship between participation and productivity are less striking but still suggest the existence of a small, though statistically significant, positive association under certain conditions.

In contrast, other quantitative reviews have apparently failed to substantiate significant participation-outcome relationships. The authors of one review (Locke, Feren, McCaleb, Shaw, & Denny, 1980) aggregated percentage-of-change measures across a collection of field studies assessing various productivity interventions and reported that the introduction of participation resulted in a median percentage of change in productivity of only half a percent. Those results seem to deny the existence of a notable relationship between participation and productivity.

In another study (Wagner & Gooding, 1987), we performed a meta-analysis of 118 correlations measuring relationships between participation and a variety of outcomes. After adjusting for sampling error, we reported a mean correlation of .32 across the 118 correlations between participation and its outcomes. However, dividing those 118 correlations into two subgroups yielded widely differing means. For the 47 percept-percept correlations— those based on data obtained from the same respondents using the same questionnaire at the same time—we found a mean correlation of .39. A mean correlation of only .12 emerged for the 71 remaining multisource correlations— those based on data from multiple sources. These results suggest that evidence substantiating positive participation-outcome relationships might be

largely artifactual: it may reflect the inflation of effect size often engendered in percept-percept procedures rather than the true level of efficacy of participatory processes.

In sum, existing quantitative summaries apparently provide discrepant evidence concerning the strength of relationships between participation and several outcomes. The discrepancy may be partially illusory, however, because two sets of results (Guzzo et al., 1985; Locke et al., 1980) are subject to important qualifications. In sociotechnical interventions like those reviewed by Guzzo and colleagues, changes in job designs, compensation programs, or other organizational practices usually accompany the introduction of participation. As Guzzo and colleagues noted and Locke and coauthors empirically demonstrated, such additional changes can combine with participation to induce improvements in productivity that are larger than the improvements attributable to participation alone. Therefore, the average improvement in productivity that Guzzo and colleagues found across sociotechnical interventions is probably an overestimate of the effects attributable to participation per se. Conversely, Locke and colleagues used aggregation procedures that did not involve meta-analytic adjustments for sampling error or other measurement artifacts. Their results may therefore underestimate the true size or variance of effects attributable to participation (Hunter, Schmidt, & Jackson, 1982).

The two recent meta-analyses (Miller & Monge, 1986; Wagner & Gooding, 1987) avoid such problems because both included adjustments for sampling error and focused directly on participation as defined by Locke and Schweiger (1979). However, their results appear inconsistent: Miller and Monge's study supports the existence of positive relationships between participation and its outcomes, especially under certain situational conditions, but our study suggests that nonartifactual relationships between participation and its outcomes are likely to be quite small. Given that discrepancy, it seemed critical to examine whether percept-percept artifacts account for evidence substantiating positive participation-outcome relationships or whether positive multisource relationships can be substantiated through moderator analyses. In addition, we sought to determine whether moderating effects like those reported by Miller and Monge are mainly the product of percept-percept artifacts, or if instead they can be detected among multisource correlations. The present study addressed those issues, using meta-analysis to examine the simultaneous effects of situational moderator variables and percept-percept versus multisource measurement on relationships between participation and its outcomes.

METHODS

Data and Coding

Data for the present study were collected from the 70 studies that we previously referenced in our meta-analytic review of published U.S. research on participation-outcome relationships (Wagner & Gooding, 1987).

The studies contrasted directive processes with participative processes and examined the same five outcome variables often enough to allow meta-analytic aggregation. Those variables were *task performance* on jobs managed by directive or participative processes, *decision performance* within directive or participative processes themselves, *motivation* to perform jobs managed by directive or participative processes, *satisfaction* with jobs managed by directive or participative processes, and *acceptance* of the consequences of directive or participative processes. The 70 studies yielded 118 correlation coefficients, which we coded as data for the present study, along with associated statistics on the sizes of samples. In addition, we coded percept-percept and multisource measures using the definition introduced in the account of our previous study and inspected the 70 studies for situational variables that might moderate relationships between participation and its outcomes. On the basis of that inspection, we coded four situational variables for each correlation coefficient using the following decision rules.

Group size. Group size was examined as a situational moderator variable because participation is likely to be more efficacious in small groups than in large ones owing to the ease with which relatively few people can share information and influence (Gardner, 1977; Vroom & Mann, 1960). Three types of experimental designs appeared in the 70 studies: laboratory experiments, field experiments, and nonexperimental field observations. Inspection revealed that differences in experimental designs would confound comparisons of differences in absolute group size because small group correlations would overrepresent laboratory techniques and large group correlations would overrepresent field studies. Consequently, we split the distribution of data on group size for each type of experimental design at its median to differentiate between small and large groups. Laboratory experiment groups of fewer than 4 members, field experiment groups of fewer than 12 members, and field observation groups of fewer than 7 members were coded as small. We coded others as large so long as studies provided information on group size.

Task interdependence. Task interdependence is likely to necessitate interpersonal exchanges of information that might enhance the importance and outcome efficacy of participatory processes (Koch & Fox, 1978; Lawler, 1982). We coded tasks whose performance required sequential or reciprocal interdependence (Thompson, 1967) as interdependent and designated other unambiguously described tasks as independent.

Task complexity. The information processing requirements of complex tasks might enhance the importance and outcome efficacy of participation (Anderson, 1959; Koch & Fox, 1978); conversely, participation might prove efficacious if employed as a technique to enrich otherwise simple tasks (Locke & Schweiger, 1979; Vroom & Mann, 1960). For field studies that provided the necessary information, we coded as complex those task descriptions that displayed evidence of nonroutine information processing, uncertainty reduction, or decision making (Koch & Fox, 1978; Perrow, 1967). Tasks whose descriptions indicated little evidence of those characteristics

were coded as simple. For laboratory studies reporting adequate information, we coded unstructured tasks or tasks whose performance involved non-routine information processing or decision making as complex, and routine, easily mastered tasks as simple.

Performance standards. Performance standards might reduce participation's efficacy by functioning as an alternative mechanism for feedback on performance (Argyle, Gardner, & Cioffi, 1958). Alternatively, performance standards might add motivational impetus in participatory settings, enhancing participation's apparent outcome efficacy as a consequence (Locke & Schweiger, 1979). We coded both those studies whose procedures involved the announcement of specific levels of expected performance and those that involved incentive payments or other performance-contingent rewards as including performance standards. Remaining studies that provided unambiguous information were coded as excluding performance standards.

Each of us coded moderators independently. We assessed coding reliability by examining the percentage of interrater reliability associated with the coding of each moderator variable (Bullock & Svyantek, 1985; Orwin & Cordray, 1985). Complete agreement occurred in all instances except for two (2.3%) of the coding assignments involving task interdependence and five (5.4%) involving task complexity. We rectified inconsistencies by again following a procedure recommended by Bullock and Svyantek (1985): we discussed disagreements and resolved them by consensus, then reexamined all 70 studies until we reached complete agreement. Table 1 shows the resulting coding assignments for all moderator variables.

Procedures

Analyses reported previously (Wagner & Gooding, 1987) revealed that considerable variance among the 118 correlations remained unexplained after we removed the effects of sampling error and differences between percept-percept and multisource measurement techniques. Thus, we concluded that further moderator analyses could justifiably be performed. We followed a six-step process in the present study to perform a separate subgroup comparison for each situational moderator variable. First, we split the collection of 118 correlations into paired subgroups classified according to their having relevant moderator characteristics. Situational moderator subgroups were then nested within percept-percept and multisource groups to control for the effects of differing research techniques. Correlations from studies reporting ambiguous information on moderators, which are denoted by dashes (—) in Table 1, were dropped from relevant moderator analyses. Consequently, most analyses included fewer than 118 correlation coefficients. Second, we calculated a mean correlation ($\bar{r}$) weighted by sample size within each subgroup, following a procedure outlined by Hunter, Schmidt, and Jackson (1982). Corrections for measurement error and range restriction suggested by those authors could not be completed because such relevant information as specification of reliability coefficients was missing in many participation-outcome studies. Other recent meta-analyses (e.g., Gooding &

TABLE 1
Participation Studies Included in the Meta-Analysis and Situational Variable Coding Assignments[a]

Studies	Codes for Moderator Variables			
	Group Size	Task Interdependence	Task Complexity	Performance Standards
Abdel-Halim (1983)	—	—	—	Absent
Abdel-Halim & Rowland (1976)	Large	Interdependent	Complex	Absent
Alutto & Acito (1974)	—	—	Simple	Absent
Alutto & Belasco (1972)	—	Interdependent	Complex	Absent
Alutto & Vrendenburgh (1977)	—	Interdependent	Complex	Absent
Bass et al. (1975)	—	—	—	Absent
Bennett (1955)	Large	Independent	Complex	Absent
Berkowitz (1953)	Large	Interdependent	Complex	Absent
Bridges et al. (1968)	Large	Interdependent	Complex	Absent
Castore & Murnighan (1978)	Large	Interdependent	Complex	Present
Conway (1976)	—	Interdependent	Complex	Absent
Cooper & Wood (1974)	Small	Interdependent	Complex	Present
Dossett et al. (1979)	Small	Independent	Simple	Present
Driscoll (1978)	—	Independent	Complex	Absent
Fiman (1973)	—	Independent	Simple	Absent
Fox (1957)	Large	Interdependent	Complex	Absent
French et al. (1966)	Small	Interdependent	Complex	Absent
Gibb (1951)	Large	Interdependent	Complex	Absent
Green & Taber (1980)	Large	Interdependent	Complex	Absent
Greller (1975)	Small	Interdependent	Complex	Present
Greller (1978)	Small	—	—	Present
Haythorn et al. (1956)	Large	Interdependent	Complex	Absent
Hoffman et al. (1965)	Large	Interdependent	Complex	Absent
Hrebiniak (1974)	Large	Interdependent	Complex	Absent
Ivancevich (1977)	—	Independent	Complex	Present
Jackson (1983)	Small	Interdependent	Complex	Absent
Jenkins & Lawler (1981)	—	Interdependent	Simple	Present
Jermier & Burkes (1979)	—	—	—	Absent
Kipnis (1958)	Large	Independent	Complex	Present
Lanzetta & Roby (1960)	Small	Independent	Simple	Absent
Latham & Marshall (1982)	Small	Interdependent	Complex	Present
Latham et al. (1978)	Small	Independent	Complex	Present
Latham & Saari (1979a)	Small	Independent	Simple	Present
Latham & Saari (1979b)	Small	Independent	Simple	Present
Latham & Steele (1983)	Small	Interdependent	Simple	Present
Latham & Yukl (1976)	Small	Independent	Simple	Present
Maier (1953)	Large	Interdependent	Complex	Absent
McCurdy & Eber (1953)	Small	Interdependent	Simple	Absent
McCurdy & Lambert (1952)	Small	Interdependent	Simple	Present
Mitchell et al. (1975)	—	—	—	Absent
Morse & Reimer (1956)	—	Independent	Simple	Absent
Neider (1980)	—	Independent	Simple	Absent
Nurick (1982)	—	—	—	Absent
Patchen (1965)	Large	Interdependent	Complex	Absent
Pennington et al. (1958)	Large	Interdependent	Simple	Present
Richter & Tjosvold (1980)	Large	Interdependent	Complex	Absent

TABLE 1 (continued)

Studies	Codes for Moderator Variables			
	Group Size	Task Interdependence	Task Complexity	Performance Standards
Ritchie & Miles (1970)	—	Interdependent	Complex	Absent
Roberts et al. (1968)	—	Interdependent	Complex	Absent
Roby et al. (1963)	Large	Interdependent	Simple	Absent
Rosenbaum & Rosenbaum (1971)	Large	Interdependent	—	Absent
Ruble (1976)	Small	Interdependent	Simple	Absent
Runyon (1973)	Small	—	Simple	Absent
Schuler (1976)	—	—	—	Absent
Schuler (1980)	—	—	—	Absent
Seeborg (1978)	Large	Interdependent	Complex	Absent
Seeman & Seeman (1976)	Large	Interdependent	Complex	Absent
Shaw (1955)	Large	—	Simple	Absent
Smith (1970)	Large	Interdependent	Complex	Absent
Torrance (1953)	Large	Interdependent	Complex	Absent
Tosi (1970)[b]	Large	Interdependent	Complex	Present
Turnage & Muchinsky (1976)	Small	Independent	—	Present
Vroom (1960)	—	Interdependent	Complex	Absent
Vroom & Mann (1960)	Large	—	Simple	Present
Wexley et al. (1973)	Small	Independent	Complex	Present
White & Ruh (1973)[c]	—	—	—	Absent
Wofford (1971)	—	—	—	Absent

[a] Additional meta-analytic information (variance and confidence interval statistics) for each subgroup comparison are available in tables obtainable from the authors. Dashes (—) indicate that information was ambiguous and thus not used as data.

[b] Also includes Tosi (1971, 1973).

[c] Also includes Ruh, White, and Wood (1975) and Siegel and Ruh (1973).

Wagner, 1985; Schmitt, Gooding, Noe, & Kirsch, 1984) have reported similar problems. Third, we calculated the observed variance among correlations in each subgroup using an average squared error weighted by sample size (Hunter et al., 1982). Fourth, we used that variance statistic to calculate approximate *t*-test statistics, which we chose to use since comparisons were performed between subgroups with differing sizes and variances (Fisher, 1935; Scheffé, 1970). Fifth, we employed approximate *t*-tests (*t'*-tests) to assess differences between each outcome's correlations across differing moderator conditions within a constant research-technique condition. Thus, we examined moderators' effects holding percept-percept or multisource differences constant. Criterion statistics for each *t'*-test were derived with a variance-weighted procedure suggested by Cochran and Cox (1957). Subgroup cells containing only a single correlation prior to averaging were not considered during *t'*-testing due to the absence of cell variance. Sixth, we assessed the magnitude of each mean correlation revealed in statistically significant moderator analyses using Cohen's (1977) criterion for measuring effect size. According to that standard, in behavioral research correlational

magnitudes corresponding to small, medium, and large effect sizes are $r =$ .10, .30, and .50, respectively. Since our previously reported findings (Wagner & Gooding, 1987) suggested that the mean percept-percept correlations found in the present study would most likely be medium to large, we decided to denote mean percept-percept correlations revealed through significant moderator analyses as noteworthy if they were smaller than .30. Similarly, since our previous results suggested that mean multisource correlations examined in this study would most likely be relatively small, we decided to denote mean multisource correlations revealed in significant moderator analyses as noteworthy if they were larger than .30.

RESULTS

Before assessing situational moderators, we established some outcome-specific contrasts between percept-percept and multisource conditions. Correlations based on percept-percept measures were those for which a single group of respondents had answered items relating to both participation and outcome variables in a single questionnaire. Multisource correlations were those that researchers had gathered using at least one objective measure or assigned condition, different respondents for data on participation and outcome variables, or a longitudinal break between the collection of data on both participation and outcome variables from the same respondents. As Table 2 shows, significant contrasts emerged in most instances. In addition, all mean percept-percept correlations were medium or large in size ($\bar{r} > .30$), and all mean multisource correlations were small ($\bar{r} < .30$), although mean multisource correlations measuring relationships between participation and decision performance and those between participation and motivation were noticeably larger than the remaining three mean multisource correlations.

All researchers examining decision performance had operationally defined it with various indicators of observed output. Examples included the number of problems solved per unit of time (McCurdy & Eber, 1953), the speed of problem solution (Roby, Nicol, & Farrell, 1963), and the proportion of discussion agendas completed (Berkowitz, 1953). The consequent absence of percept-percept correlations blocked assessment of the effects of differing research techniques on the relationship between participation and decision performance. In addition, a comparison between participation-motivation correlations showed no significant differences. The combination of adjustment for sampling error and subgrouping by research technique explained 100 percent of the variance observed among multisource correlations between participation and motivation. That finding, together with the absence of a sufficient number of relevant percept-percept correlations, precluded further contrasts involving participation-motivation correlations.

Data were insufficient to perform 8 of the remaining 28 possible comparisons assessing the effects of the four situational moderators on the four outcome variables within the two research-technique groupings. In particular, in studying decision performance, only multisource data had been used. Table 3 summarizes the results of the remaining 20 contrasts.

TABLE 2
Effects of Differing Research Techniques
on Participation-Outcome Relationships

Variables	Mean Correlations[a]				
	Percept-Percept		Multisource		t'
Task performance	.454	(4)	.108	(25)	4.088**
Decision performance	—	—	.212	(12)	—
Motivation	.347	(3)	.252	(3)	1.099
Satisfaction	.423	(27)	.109	(23)	6.159**
Acceptance	.347	(13)	.093	(8)	3.892**

[a] Numbers in parentheses indicate the frequency with which types of correlations appeared in the data.
** $p \leq .01$

Group size was the first situational moderator assessed. Comparisons involving mean percept-percept correlations showed no significant differences across studies arranged by group size. Similarly, for comparisons involving mean multisource correlations, only the comparison between participation-satisfaction correlations indicated a significant difference across group-size conditions. However, neither of the mean correlations examined in that comparison was larger than .30.

The moderating effects of task interdependence were examined next. As shown in Table 3, comparisons between mean percept-percept correlations between participation and satisfaction and between mean multisource correlations indicated no significant differences. Thus, task interdependence failed to demonstrate any effect as a moderator variable.

Task complexity was the third situational variable examined. No significant difference emerged when we contrasted the percept-percept relationships between participation and satisfaction across differing subgroups based on task complexity. Contrasts between mean multisource correlations involving task and decision performance also failed to reveal statistically significant differences. However, multisource participation-satisfaction and participation-acceptance correlations differed significantly. Although further examination of the moderating effect of task complexity failed to reveal a noteworthy relationship between participation and satisfaction, a mean multisource correlation of .315 emerged between participation and acceptance in simple task situations.

The final analysis focused on the moderating effects of performance standards. For percept-percept data, there were no significant differences involving satisfaction, but the relationship between participation and acceptance differed to a statistically significant degree. None of the four multisource contrasts revealed a significant difference.

TABLE 3
Moderating Effects of Situational Variables
on Participation-Outcome Relationships[a]

Variables	Mean Correlations[b]				t'
Group size	**Small groups**		**Large groups**		
Percept-Percept					
Satisfaction	.437	(5)	.420	(4)	.175
Acceptance	.435	(5)	.310	(2)	.770
Multisource					
Task performance	.075	(9)	.117	(10)	.485
Decision performance	.266	(4)	.202	(8)	.412
Satisfaction	.254	(6)	.028	(13)	2.718*
Task interdependence	**Interdependent**		**Independent**		
Percept-Percept					
Satisfaction	.324	(9)	.257	(2)	.851
Multisource					
Task performance	.111	(16)	.104	(9)	.104
Satisfaction	.059	(15)	.119	(5)	.618
Acceptance	.178	(5)	.024	(2)	1.500
Task complexity	**Complex**		**Simple**		
Percept-percept					
Satisfaction	.306	(11)	.345	(4)	.658
Multisource					
Task performance	.118	(14)	.097	(10)	1.532
Decision performance	.262	(5)	.172	(7)	.512
Satisfaction	.035	(15)	.258	(6)	2.962**
Acceptance	.048	(5)	.315	(3)	2.082*
Performance standards	**Present**		**Absent**		
Percept-percept					
Satisfaction	.463	(7)	.417	(20)	.819
Acceptance	.476	(4)	.333	(9)	2.285*
Multisource					
Task performance	.021	(11)	.217	(14)	1.908
Decision performance	.175	(2)	.215	(10)	.231
Satisfaction	.105	(7)	.111	(16)	.068
Acceptance	.198	(4)	.031	(4)	1.681

[a] Each t'-test was performed between two samples that differed from the samples contrasted in most other t'-tests. Thus, significant findings are less likely to be an artifact of the number of tests performed than would be the case if a similar number of t-tests were performed on a single sample.

[b] Numbers in parentheses indicate the frequency with which types of correlations appeared in the data.

* $p \leq .05$
** $p \leq .01$

DISCUSSION

In an attempt to resolve apparent discrepancies among recent quantitative reviews of research on relationships between participation and outcomes, we performed meta-analytic comparisons examining the moderating effects of four situational variables on such relationships. Within these comparisons, we controlled for the influence of differing research techniques. An initial analysis indicated whether data that were collected with percept-percept or multisource techniques affected relationships between participation and task performance, satisfaction, and acceptance. Lack of percept-percept measures of the relationship between participation and decision performance precluded assessment of the effects of research techniques on that relationship. Also, research technique did not appear to affect the relationship between participation and motivation.

Additional analyses indicated that the four situational moderators failed, except in one instance, to influence percept-percept measures of participation-outcome relationships. Thus, existing evidence concerning the moderating effects of situational variables cannot be attributed solely to biases associated with percept-percept artifacts. Those analyses also showed that the four situational moderators affected several multisource relationships and revealed a noteworthy ($\bar{r}$ = .315) mean multisource correlation between participation and acceptance in situations where participants were required to perform simple tasks. A significant ($\bar{r}$ = .258) relationship between participation and satisfaction in such task situations also emerged. These findings seem important because they support suggestions that participation might enrich simplified work (Locke & Schweiger, 1979) but indicate that normative statements prescribing participation as a mechanism for increasing acceptance and satisfaction (e.g., Vroom & Yetton, 1973) are subject to significant situational constraints. All of the remaining 20 multisource measures examined in moderator analyses were smaller than the cutoff ($\bar{r}$ = .30) we employed to denote noteworthy relationships. If the power of a moderating variable is judged, in part, by its ability to reveal strong but otherwise hidden findings, then those results suggest that the situational variables we examined possess only modest power as moderators in participation-outcome research.

The findings are subject to several qualifications. Since we considered only published research performed in the United States, generalization from this study to populations in other cultures seems unfounded (Hofstede, 1980). Moreover, within the U.S. context, generalization may be valid only when limited to the outcome variables, situational moderators, and two research techniques that we examined above; also, the many data limitations encountered during analysis may make even modest generalization tenuous. Subgroup cells containing fewer than two source correlations precluded 12 out of 32 possible moderator contrasts in this study. Therefore, further participation-outcome research is needed before unequivocal conclusions can be reached concerning the moderating effects of group size, task interdependence, task complexity, and performance standards. Finally, the

file drawer problem (Rosenthal, 1979) may have affected the results reported because data collection was restricted to published articles. However, in light of the large number of nonsignificant findings published in participation-outcome research, the likely influence of Rosenthal's file drawer artifact appears negligible.

The combination of situational variables and research techniques examined in this study failed to yield, in practical terms, results that differ much from findings discovered through subgrouping by research technique alone. Except for the relationship between participation and motivation, which appears unaffected by percept-percept versus multisource differences, multisource correlations are typically small and percept-percept correlations are usually moderate to large. Discrepancies between the positive participation-outcome findings reported by Miller and Monge (1986) and the nonsignificant multisource results of our earlier study (Wagner & Gooding, 1987) can be mostly resolved on the basis of that finding. Miller and Monge found an especially strong mean correlation ($\bar{r}$ = .462) between satisfaction and perceived multiple-issue participation. Post hoc inspection of the 20 relevant studies they cited indicated that 18 (90 %) clearly involved percept-percept data collection techniques. Those researchers also reported small mean participation-satisfaction correlations (.156, .212) in two other moderator conditions, neither of which supported a strong participation-satisfaction relationship. However, they discovered a strong mean participation-satisfaction correlation ($\bar{r}$ = .379) across nonorganizational studies, all of which used students as subjects. Inspection revealed the absence of percept-percept procedures in those studies since participation was manipulated as an experimental condition rather than measured as a questionnaire variable. Thus, type of subject appears to be a source of methodological artifacts that is comparable in effect to the difference between multisource and percept-percept measurement examined in the present study.

With respect to the relationship between participation and productivity, Miller and Monge found mean correlations in three of four moderator conditions (−.011, .113, .273) whose range resembled the range of mean multisource participation-task performance and participation decision-performance correlations (.021 to .266) reported in Table 3; inspection of the studies involved showed few percept-percept measures since objective outcome measures or performance ratings were typically used to assess productivity in relevant source studies. As for the fourth moderator condition, Miller and Monge reported a mean participation-productivity correlation of −.333 across laboratory studies of directive versus participative leadership. Although percept-percept versus multisource differences do not readily explain that finding, it certainly fails to support the existence of a positive relationship between participation and its outcomes.

In conclusion, some of the results reported by Miller and Monge (1986) that seem to support the existence of positive participation-outcome relationships appear instead to be largely the product of the percept-percept effects reported in our previous research. In addition, however, Miller and Monge's

study highlights another important source of methodological artifacts—differences between types of subjects—that has influenced published evidence supporting the existence of positive participation-outcome relationships. These findings have important practical implications because they suggest that the participatory management programs being implemented with increasing frequency in U.S. work organizations might fail to yield many of the strong objective gains in outcomes, other than motivation, that existing research seems to predict. Evidence presented in this study on that point cannot be considered definitive, however, owing to the data limitations we have noted. Therefore, additional research is required to determine more completely whether participation possesses outcome efficacy beyond effects that can be attributed to percept-percept or sample artifacts. Meanwhile, the artifactual effects of percept-percept procedures and type of subject should be carefully examined in future reviews of research on participation and its outcomes. In addition, we suggest that researchers interested in minimizing the pitfalls inherent in procedural artifacts should avoid using percept-percept techniques when conducting participation-outcome research and should also reconsider the use of students as subjects if they intend to generalize their findings to organizational settings.

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RESEARCH NOTES

ENTRY INTO TRAINING PROGRAMS AND ITS EFFECTS ON TRAINING OUTCOMES: A FIELD EXPERIMENT

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Most of the discussion and research on training has taken an organizational perspective. Assessing groups' needs for training, selecting appropriate training procedures, and determining how training should be evaluated have all figured as issues (Goldstein, 1974). Surprisingly little attention has been given to how the point of view of employees relates to expectations, attitudes, or decisions to select training programs. The type of announcement or prior information individuals receive about a training program and the amount of freedom they have to to take the program, two variables that could affect their entry into a training program, were the focus of this study.

PRIOR INFORMATION AND OUTCOMES

Researchers have offered explanations for the effectiveness of such prior job information as realistic job previews in reducing turnover and changing perceptions, attitudes, and other behaviors (Breaugh, 1981; Dugoni & Ilgen, 1981). A realistic preview usually provides some positive, neutral, and unfavorable statements. In contrast, a traditional preview usually contains some overly positive statements but few, if any, negative statements.

This study related use of realistic job previews to training outcomes. Mastery of training material was a major dependent variable, along with self-report measures of motivation to learn, commitment to the decision to attend, and satisfaction with training.

As several researchers have observed (Campbell, 1971; Campbell, Dunnette, Lawler, & Weick, 1970), interest in particular forms of training occurs in cycles, rather like fads. The type of information that is written about training programs reflects those cycles. Much of this information is hard to believe. Descriptions found in brochures or in-house memos often accentuate the programs' positive aspects. If employees are not blitzed with

positive statements, they may receive practically no information and end up not knowing what to expect.

In light of the literature on organizational entry (e.g., Wanous, 1977), neither condition is desirable. Instead, giving participants a realistic or balanced point of view is preferable. If they receive realistic training information before entering a program, employees can see in what ways it fits into their self-development plans. They should be able to see the relevance of training to the demands of their work. When training is a good match to needs, individuals should have a heightened desire to learn, a precondition for the effectiveness of training programs (Porter, Lawler, & Hackman, 1975; Wexley & Latham, 1981).

Only a few studies have examined the role of trainees' expectations and perceptions before participation. For example, Hoiberg and Berry (1978) measured navy recruits' expectations about training and their perceptions of what the situation really was during their training. They found that differences in those variables on ten indicators of social climate, especially measures of pressure and control, were related to recruits' graduation. They also pointed out the importance of expectations and perceptions as they related to sailors' performance in technical school and on their fleet assignments. Unmet expectations had negative consequences in those areas as well.

Degree of Choice

Degree of choice, or how much opportunity employees have to select training opportunities on the basis of their own needs and desires, is an important variable for several reasons. First, although it has not been studied extensively, some researchers have found that it influences trainees' success in grasping training material and alters how frequently trainees voluntarily leave a program before its conclusion (Ryman & Biersner, 1975).

Second, employees' degree of choice in selecting training frequently varies from company to company and across programs within a company. Given such variation, it would be helpful from a policy-making standpoint to know how degree of choice affects the conditions for learning.

Third, choice has been linked with commitment to a situation or decision. Increased commitment occurs under conditions of choice (Salancik, 1977). Individuals who have not made a choice are less likely than those who have to conclude that their behavior—in this case, participation in training—has any implications for their attitudes or future behavior. When individuals are committed to a situation, they tend to develop attitudes consistent with their commitment and their committing behavior (Kiesler, 1971; Salancik, 1977). Commitment should affect the amount of effort that a trainee expends to learn the material that is presented and to try out, practice, and implement the new knowledge in future settings.

Predictions

Employees who receive a realistic preview of a training program, one including a number of neutral and unfavorable statements, instead of a brief,

overly positive traditional announcement should be more motivated to learn and should get more from a training experience. Similarly, employees who attend a training program because they want to, not because of external pressures, should profit more from the experience. We tested these predictions in a field experiment.

METHODS

A large not-for-profit research and development organization with head-quarters in Ohio was the site for this study. Of the approximately 340 managers and supervisors working at the site, 101 attended at least part of a two-day workshop on performance reviews and interviewing, and 85 completed the entire program. The training concerned how to write performance objectives and staff development plans, how to make accurate performance ratings, and how to effectively give feedback to employees during performance reviews.[1] We manipulated the prior information employees received about the workshop and their degree of choice about taking it.

Procedures

After identifying the buildings and floors where the employees from each department worked, we divided the buildings and floors into four groups that housed a mixture of managers from various departments engaged in either physical and social sciences research or service and support functions. Thus, each of the four groups included employees from several departments. We then randomly assigned the groups to the treatment conditions, which represented various combinations of type of prior information about the training and degree of choice about taking it.

The first group of managers ($N = 33$) received a realistic training preview and had a low degree of choice. They received a memo from their supervisors commanding them to take the program. It was desirable for our purposes that the low-choice memo offer little or no reason, in terms of development, for subordinates to take the workshop. Thus, the only reason for participation given was that supervisors had made a commitment to help the training department staff the workshop. Later, employees received a realistic training preview from the training department, a written announcement containing five sections covering expected outcomes from the training program, the topics the workshop leaders would discuss, and the circumstances under which an employee should take the training program. We constructed the realistic preview after a great deal of pilot work and followed the tradition of the literature (e.g., Breaugh, 1981). Appendix A describes the development of both the realistic announcement and the traditional announcement used for the other employees.

The second group ($N = 21$) received a traditional training program announcement and had a high degree of choice. The announcement, sent by

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[1] Hicks (1983) has further details on the training program.

the training department, briefly described the major features of the workshop, gave information about the dates, times, and location, and exaggerated the workshop's benefits. Review of the company's policies through discussion with a pilot group of employees had shown that employees typically felt they had a lot of freedom about whether to select training programs. Thus, explicit induction of a high degree of choice would have been redundant. Employees in the second group received no explicit pressure from their supervisors to attend the program.

The third group ($N = 25$) received the realistic training preview from the training department and no pressure from upper-level managers to take the program. Finally, the fourth group ($N = 22$) received the low-choice memo from their supervisors commanding them to take the program; later they received the traditional announcement. Managers in the four treatment conditions participated in each of the four training sessions.

Overall, there were 263 managers and supervisors in the high-degree-of-choice conditions and 77 managers in the low-degree-of-choice conditions who were potential participants for the workshop. Of those with a high degree of choice, 46 (17%) attended the program, whereas 55 (71%) who had a low degree of choice attended.

Questionnaire Measures

Each manager who attended training was asked to complete questionnaire I at the beginning of the program. It included a check on the success of the two inductions of the independent variable as well as items that asked the trainees about the appropriateness of the workshop and their feelings regarding their decision to attend. Appendix B contains details on the measures.

Trainees received questionnaire II after completing the program. It included items that measured the extent to which the participants were able to profit from the training, their perception of the information in the announcement, their level of motivation to learn, and their satisfaction with the training. Another part asked participants for a self-assessment of the degree to which they learned various topics or behaviors—how to write performance objectives, for instance—and for an overall rating about what was learned. The last part of the second questionnaire was an achievement test to measure mastery of the training material. It asked participants to write a staff development plan and a performance objective, to match rating errors with their appropriate definitions, and to match types of performance-review interviews with their appropriate descriptions. We developed both questionnaires, pretesting them with pilot groups and then refining them. Appendix B also contains details on the second questionnaire.

Behavioral Measures

Behavior was measured through evaluations of audiotapes of the trainees carrying out simulated performance reviews. Trainees were assigned to

groups of three and rotated their positions so that each had an opportunity to give performance-review feedback.

Six university students, who received course credit for their participation, evaluated the tapes of role playing sessions and also evaluated the written achievement tests. They worked in groups of three and were blind to the experimental conditions of trainees. Following Latham and Saari's (1979) procedure, we had participants evaluated on how well they performed the key behaviors taught in the training during the simulated performance review.

Coefficients of stability were calculated for the measures and items from questionnaire II. About 12 days after the series of workshops ended, we sent copies of that questionnaire to 20 participants in order to calculate test-retest reliability measures (see Appendix B). Fifteen participants completed the questionnaire a second time. Because three students evaluated each tape of role playing sessions and each achievement test, we could determine interrater reliability coefficients ($r = .81$ and $.89$, respectively).

Data Analyses

A 2×2 MANOVA was used to test both for the main effects of degree of choice and type of prior information and for possible interaction effects. Measures from questionnaire I provided manipulation checks for the independent variables dealing with the type of prior information and degree of choice. The MANOVA revealed that those who received the realistic announcement rated their prior information as significantly more accurate and as less positive or glowing than did those who received the traditional announcement ($F = 41.67, p < .01$). Similarly, those with a low degree of choice felt significantly less freedom and more pressure to attend ($F = 64.23, p < .01$) than did those with a high degree of choice. Thus, the experimental manipulations seem to have been effective.

RESULTS

Results of the multivariate tests for main effects were significant at the .01 level, but the interaction of degree of choice and type of prior information was not significant. Table 1 presents the means and standard deviations for the dependent variables. Table 2 presents values for F and for tests of significance.

Entry conditions affected many of the variables of interest. Trainees who received the realistic training preview and those who had a high degree of choice were more likely to believe the workshop was appropriate for them to take, were better able to profit from training, and showed more commitment to their decisions to attend the workshop than trainees who received the traditional announcement and those who had a low degree of choice. Trainees who had a high degree of choice were also more satisfied than those who received the low-choice memo.

There were similar main effects for self-assessed motivation to learn. Managers who either received the realistic preview or had a high degree of choice were more motivated to learn than the other trainees.

TABLE 1

Means and Standard Deviations

	Experimental Conditions[a]							
	Realistic Preview/ High Degree of Choice		Realistic Preview/ Low Degree of Choice		Traditional Announcement/ High Degree of Choice		Traditional Announcement/ Low Degree of Choice	
Variables[b]	Means	s.d.	Means	s.d.	Means	s.d.	Means	s.d.
Commitment to decision to attend	6.16	1.37	5.64	1.19	4.95	1.32	4.36	1.09
Appropriateness of taking training	6.08	1.41	4.97	1.59	5.05	1.36	3.95	1.29
Expectancies	6.12	1.04	5.61	0.99	4.28	1.59	4.26	0.85
Profit from training	6.28	0.68	5.70	1.07	5.31	0.70	5.06	0.66
Motivation to learn	6.14	0.76	4.80	1.13	4.94	0.63	3.94	0.85
Satisfaction with training	6.20	0.82	5.33	1.78	6.06	0.68	4.82	0.73
Self-report measure of what was learned	5.48	1.16	4.52	1.70	5.25	1.06	4.18	0.88
Achievement test[c]	24.19	6.49	21.99	6.07	23.04	4.57	19.88	4.94
Role playing performance[d]	2.97	0.75	3.08	0.57	3.49	0.46	3.03	0.54

[a] N = 25, 33, 21, and 22, respectively.
[b] Unless otherwise stated, responses ranged from 1–7.
[c] Scores ranged from 1–36.
[d] Ratings ranged from 1–5.

TABLE 2
Results of Univariate Analysis of Variance for the Dependent Variables[a]

Variables	Degree of Choice		Type of Prior Information		Interaction	
	MS	F	MS	F	MS	F
Commitment to decision to attend	7.36	4.57*	26.56	16.51**	1.61	1.00
Appropriateness of taking training	22.39	11.07**	34.78	17.19**	0.99	0.49
Expectancies	1.04	0.86	49.74	41.21**	0.90	0.74
Profit from training	3.69	5.25*	12.62	17.97*	0.63	0.90
Motivation to learn	26.55	32.86**	20.63	25.54**	0.53	0.66
Satisfaction with training	22.26	15.53**	1.55	1.08	0.61	0.43
Self-report measure of what was learned	21.66	13.05**	2.53	1.53	0.01	0.01
Achievement test	144.33	4.28*	39.25	1.16	4.04	0.12
Role playing performance	0.42	1.16	0.89	2.48	1.26	3.52

[a] Overall multivariate tests for degree of choice and type of prior information were significant at $F = 4.85$, $p < .01$ and $F = 10.39$, $p < .01$, respectively.

[b] Degrees of freedom for univariate tests: Degree of choice = 1, type of prior information = 1, interaction = 1, error = 78.

*p < .05
**p < .01

Type of prior information did not have an effect on any of the three measures of learning. However, degree of choice had a main effect on two of the three measures: participants who had a high degree of choice received higher achievement test scores and reported that they learned more from the training than those who had a low degree of choice. There were no significant effects on role playing performance.

DISCUSSION

The manipulations in this field experiment did influence the process and outcomes of the training program. Consistent with past research and with our predictions, the results showed differences in (1) trainees' commitment to their decisions to attend, (2) the perceived appropriateness of and satisfaction with the training, and (3) their motivation to learn. Manipulations also affected actual learning. Overall, however, degree of choice appears to have had a stronger effect on the dependent variables than type of prior information; it affected not only trainees' initial perceptions and their receptivity to training but also the amount of learning that took place.

Not much research has examined the process of entering training programs from the participants' perspective. This study suggests that continued examination of this area would be valuable. Issues we examined that merit

further attention are (1) comparing degree of choice and type of information with other variables—instructors' characteristics, for instance—thought to affect training processes and outcomes, (2) analyzing how entering training affects the transfer of learning to a job setting several months or more after an employee has completed a workshop, and (3) analyzing how the order of receiving a memo mandating training and a training announcement affects dependent measures.

It should also be kept in mind that the realistic and traditional announcements varied on both the quality and the amount of information provided. The quantitative difference might be important. Similarly, for logistical reasons we decided to assign departments, not individuals, to the treatment conditions. Thus, trainees in the four treatment conditions might have systematically differed on receptivity to training or on the skills, knowledge, or abilities needed to carry out performance reviews. Such differences might have affected the pattern of results, a possibility this study could not assess.

A final consideration is that prevailing organizational practices undoubtedly influenced the manipulations. In the organization studied, the traditional type of training announcement was the norm, and a high degree of choice about attending training usually prevailed. Managers in the low-degree-of-choice condition had something taken away from them. Thus, the induction may have been especially powerful because of the contrast with past experience. We can only wonder if results would be similar if the situation were reversed and employees in an organization where a low degree of choice was the norm were merely invited to attend training sessions.

Our major general recommendation is that future researchers and training practitioners pay close attention to the nature of the conditions surrounding the process of entering training programs from the participants' perspective. Although the suggestion is not new, both practitioners and researchers unfortunately frequently ignore it. Evidence like that provided by this and other research (Klimoski et al., 1984) is making it increasingly clear that understanding the point of view of trainees is critical to attaining training outcomes and to the overall success of training interventions.

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APPENDIX A

Development of Prior Information Stimuli

A first pilot group of nine employees from the same organization was used to develop both the realistic and the traditional training program announcements. We based the traditional announcements on current organizational practices with regard to the way training programs were advertised.

Realistic announcement. The published literature on realistic previews guided the construction of the second version. The first pilot group of employees rated potential parts of a potential realistic announcement using three scales. They were asked to judge: (1) the extent to which information appeared to be positive or negative information, with 1 = the information in the section promotes the workshop in a positive way to 7 = promotes it in a negative way; (2) the extent to which the information would be important to know before coming to the workshop (7-point scale); and (3) the extent to which the information would be expected by someone who knew the course title (yes/no).

The employees were again brought together to discuss a potential realistic announcement. They were asked to evaluate its degree of balance and accuracy in describing the features of the program. We minimized statements they called "expected," "positive," and "not important to know before coming to class" and emphasized those they called "unexpected," "negative," and "important."

In particular, three features received strong emphasis as a result of the discussion. Statements in the announcement were: (1) Each participant will have a homework assignment to prepare a performance review on a current or past staff member .... Each participant also will have an optional reading assignment. (2) (Participants) will split into groups of three to role play performance review interviews. (Role playing was not done frequently in training programs at this organization.) (3) Because one leader will use some information gathered from this program for answering research questions about training, each participant will be asked to offer his/her

comments and evaluation. This information will be collected by questionnaires that will be given out at the beginning and end of the workshop.

Thus, the realistic training announcement reflected a clinical integration of the ratings and focus group sessions. It contained five sections entitled:

Outcomes You Can Expect From This Workshop

Content (e.g., topics the workshop leaders would discuss, notice of homework assignments)

Evaluation of This Workshop (e.g., questionnaires)

Who Should Attend?

Workshop Leaders, Dates, Times, Locations

Traditional announcement. Designed to follow company practices, it described the training program the way personnel staff would. It contained the following sections:

Outcomes You Can Expect From This Workshop (very brief and positive)

Content (very brief)

Workshop Dates, Times, Locations

We asked members of the pilot group whether this announcement was prototypical. They also described the extent to which it made undifferentiated claims to being suitable for all individuals.

As a check on the success of the design of the announcements, we divided a second pilot group ($N = 10$) into two groups and sent one the traditional version and the other the realistic version. We then sent a questionnaire that first asked if they had read the announcement (they all had) and then presented a list of features that could have been part of the advertised workshop. Three were not part of the workshop. Employees then rated each of the features on a 3-point scale evaluating whether it would or would not occur in the session. Results of the survey revealed that those who received the realistic announcement in fact had a more accurate view of what would occur in the workshop. They also felt that the announcement did not promote the workshop in an overly positive way.

APPENDIX B

Measurement of Dependent Variables

This appendix gives the items from questionnaires I and II that elicited participants' attitudes and perceptions about the training program and materials and describes the three measures of learning.

Managers used a 7-point scale ranging from strongly agree to strongly disagree to rate all items. The test-retest reliabilities appear next to items from questionnaire II.

Commitment to decision to attend. I believe I made a good decision to attend this workshop.

Appropriateness of taking training. At this time, I believe this workshop is the most appropriate for me to take compared to other training programs/workshops available.

Expectancies ($r = .82$). The preliminary information from staff and Organizational Development's announcement accurately described what would happen in this workshop.

Profit from training ($r = .71$). I was able to profit from this training.

Motivation to learn ($r = .88$). I was motivated to learn the training material in this workshop. I tried to learn as much as I could from this workshop.

Satisfaction with training ($r = .79$). I was satisfied with this training.

Self-report measure of what was learned ($r = .88$). Managers used a 7-point rating scale ranging from learn to did not learn to indicate whether they learned the following topics and behaviors: key parts of staff development plans; what actions to take to provide on-the-job related development opportunities for the staff; how to write performance objectives; what biases can occur when making job performance ratings; the advantages and disadvantages of the three types of performance review interviews; how to conduct effective performance-review interviews; and overall rating.

Achievement test (r = .81). Managers completed a four-part achievement test, writing one development/activity statement to be carried out by an employee and one performance objective. They matched rating errors with their appropriate definitions. For example, the correct match for "leniency error" was "the evaluator's tendency to give only favorable ratings on job dimensions." They also matched the types of performance-review interviews with their appropriate descriptions. For example, "problem solving" went with "the staff member is given maximum participation in the appraisal interview." The values of scores could range from 1 to 36.

Role-playing performance. Participants were evaluated as to how well they followed the key behaviors during a simulated performance-review discussion in which they played the role of supervisor (5-point scale, poor to excellent). An overall score was calculated by averaging ratings on the 11 key behaviors, which were: explained the reason for the performance review interview; explained what he/she expected to accomplish; protected the staff member's dignity and self-esteem; gave candid feedback about staff member's performance; gave specific feedback about staff member's performance; listened attentively for the staff member's feelings and his or her view of why things happened; used a "we" approach when discussing staff member's problems or difficulties; kept the interview on track; agreed with staff member on plans for improving the staff member's job performance; closed the performance-review interview in a positive way; and scheduled a date for the Performance Plan.

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EFFECTS OF GOAL DIFFICULTY, GOAL-SETTING METHOD, AND EXPECTED EXTERNAL EVALUATION ON INTRINSIC MOTIVATION

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A number of studies have examined the effects of goal difficulty, goal-setting method (assigned vs. participative), and evaluative contexts on task performance (Buller & Bell, 1986; Jackson & Zedeck, 1982; Latham & Saari, 1979; Locke, 1982). In general, results have shown that difficult goals and evaluative contexts enhance performance and that the method of setting goals has little effect on performance when goal difficulty is held constant (Dossett, Latham, & Mitchell, 1979; Locke, Shaw, Saari, & Latham, 1981; White, Mitchell, & Bell, 1977). Unfortunately, few previous studies have focused directly on the possible effects of those three factors on individuals' intrinsic motivation to perform a task (e.g., Chang & Lorenzi, 1983; Garland, 1983; Harackiewicz, Manderlink, & Sansone, 1984). The current research sought to assess those effects.

According to Deci (1975), people are intrinsically motivated when they engage in a task for no apparent reward other than the task itself. Measures of intrinsic motivation have included self-reports of interest in a task from participants of studies and observations of the amount of time individuals spend on a task after the specified time to work has ended (Guzzo, 1979). Although research has demonstrated that such measures have little relation to such traditional measures of task performance as work quantity (Fisher, 1978; Mossholder, 1980), several investigations have found positive associations between intrinsic motivation and individuals' creativity on tasks, risk taking, and product quality (Amabile, 1979; Lepper, Greene, & Nisbett, 1973; White & Owen, 1970). Given the increased managerial emphasis on stimulating creativity and innovation in organizations (Peters & Waterman, 1982), it seems important to understand the various factors that may enhance or diminish intrinsic motivation.

A recent study by Shalley and Oldham (1985) demonstrated that two of the factors examined in the current research, goal difficulty and evaluative context, combine to influence intrinsic motivation. Specifically, they found that individuals who were assigned an easy goal and expected a performance

evaluation exhibited high intrinsic motivation, but those in the remaining experimental conditions (easy goal/no evaluation, hard goal/evaluation, and hard goal/no evaluation) exhibited fairly low intrinsic motivation. These results are understandable in the context of cognitive evaluation theory (Deci, 1975; Deci & Ryan, 1980), according to which, perceptions of external constraint and information suggesting low task competence reduce intrinsic motivation, whereas attributions of personal causation and positive competence information enhance intrinsic motivation. Shalley and Oldham (1985) suggested that goal difficulty and external evaluation influence intrinsic motivation primarily through their effect on the information about competence individuals receive. Thus, high intrinsic motivation was exhibited in the easy goal/evaluation condition because most individuals attained the goal and therefore anticipated positive feedback from an external evaluator concerning their competence. On the other hand, relatively low intrinsic motivation was exhibited in the difficult goal conditions because most individuals were unable to attain their goal and anticipated no positive feedback concerning their own competence. Individuals in the easy goal/no evaluation condition also exhibited low intrinsic motivation because they did not anticipate positive feedback from an external evaluator.

One limitation of the Shalley and Oldham (1985) study is the fact that the effects of various goal-setting methods were not investigated—all goals were assigned to subjects by an experimenter. A number of theorists have suggested that, compared to assigning goals, participative goal setting enhances individuals' personal control, which in turn boosts levels of intrinsic motivation (Manderlink & Harackiewicz, 1984; Zuckerman, Porac, Lathin, Smith, & Deci, 1978). Unfortunately, only one previous study has examined the relationship between goal-setting method and intrinsic motivation (Chang & Lorenzi, 1983), and various methodological problems make the results of that study somewhat ambiguous.[1]

The present investigation extends the earlier Shalley and Oldham (1985) study by examining the possibility that participative goal-setting methods combine with goal difficulty and expected external evaluation to affect intrinsic motivation. We assigned subjects to one of eight experimental conditions in a 2 × 2 × 2 factorial design, with hard versus easy goal, assigned versus participatively set goal, and evaluation versus no evaluation as the factors. We expected individuals to exhibit the highest levels of intrinsic motivation when they experienced a sense of personal control through the participative process and when they anticipated positive feedback from an external source concerning their competence.

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[1] For example, in the participation condition of Chang and Lorenzi's (1983) study, subjects and experimenter discussed the goal that would be set, but the experimenter ultimately assigned goals. Since that research included no manipulation check, it is not clear that the subjects in the participation condition felt that they had more influence over the goal than subjects in the assigned condition. In addition, subjects were not given explicit instructions that they could work on the task during the free-choice period. Finally, subjects were also not told that their free-choice activity would not count toward goal accomplishment.

> Hypothesis 1: Compared to individuals in all other experi-
> mental conditions, individuals who participatively set
> easy goals and expect an external evaluation should ex-
> hibit the highest levels of intrinsic motivation.

The lowest levels of intrinsic motivation were expected when individuals experienced little personal control over the goal and when they expected little positive information about their competence.

> Hypothesis 2: Compared to individuals in all other experi-
> mental conditions, individuals who are assigned difficult
> goals and expect an evaluation or who are assigned either
> difficult or easy goals and expect no evaluation should
> exhibit the lowest levels of intrinsic motivation.

In addition to examining the effects of goal difficulty, goal-setting method, and external evaluation on intrinsic motivation, the present investigation also examined the effects of those factors on two measures often found in the literature on goal setting: task performance and goal acceptance. Although no formal hypotheses involving those dependent measures were tested, we contrasted our results with those obtained in previous studies of goal setting.

METHODS

Subjects

Pretesting indicated that men and women differed in their interest in and performance on the experimental task. To control for possible gender-based differences, we had only men participate in the study. We enlisted 96 undergraduates who were enrolled in an introductory business administration course; they earned extra credit for participating in the research.

Task and Procedures

The task involved joining Tinkertoy® pieces to form a helicopter model. Subjects were asked to assemble a specific number of models resembling a sample model. Results of a pilot test conducted with a separate group from the subject population indicated that the task was moderately interesting and satisfying.

Each subject completed two sample helicopter models to familiarize himself with the task materials. Performance time on the second model was used as an index of ability (Locke, Mento, & Katcher, 1978; Strang, Lawrence, & Fowler, 1978).

We then established the conditions for goal difficulty, goal-setting method, and external evaluation. Each subject had 20 minutes to complete a performance goal. After 20 minutes, they had a 7-minute break, during which they were free to do whatever they pleased: relax, browse through a magazine, or work with task materials. An experimenter observed subjects' behavior during the free-choice period through a one-way mirror. After 7 minutes, subjects completed a questionnaire and were debriefed.

Manipulations

Goal-setting method. In the participation condition, subjects were asked to establish a goal based on their performance on the second practice trial. The experimenter suggested a range of goals to provide some general guidelines for goal difficulty. In the assigned condition, we gave subjects a specific number of models to complete.

Goal difficulty. Goal levels were based on subjects' performance during the practice trial (Locke et al., 1981). For those in the participation condition, we suggested as guidelines either an easy or a difficult range of goals. Easy ranges described the number of models subjects would produce if they worked at 80 to 100 percent of their practice rate; difficult ranges described the number of models they would produce working at 150 to 170 percent of their practice rate. Subjects in the assigned condition received goals by a yoking procedure in which the goal established for a subject through the participative method was assigned as the goal for a randomly selected subject in the assigned condition.

Expected external evaluation. Subjects in the evaluation condition were told that their performance would be compared to the performance of other students who participated in the research. No mention was made of performance comparisons to subjects in the no-evaluation condition.

Measures

Manipulation checks. Responses to the questionnaire items administered after the free-choice period were averaged to form measures of the effectiveness of the manipulations. Specifically, four items assessed the extent to which subjects felt they participated in setting the goal ($\alpha = .80$), two items assessed perceptions of goal difficulty ($r = .70$), and three items measured the expectation of external evaluation ($\alpha = .58$). Because the external evaluation measure had somewhat low reliability, we factor analyzed the items and performed a varimax rotation. One factor emerged with an eigenvalue greater than 1.00. Since the factor loading of each item was greater than .37, we decided to include all three items in the external evaluation scale. The items composing all measures appear in the Appendix.

Goal acceptance. Four questionnaire items were averaged to form a goal-acceptance index ($\alpha = .71$). The items appear in the Appendix.

Performance. The number of pieces used for whole and partial helicopter models completed during the experimental period served as the index of task performance.

Intrinsic motivation. The amount of time participants spent on the task during the free-choice period was used as the measure of intrinsic motivation. That behavioral measure is the most widely used (Guzzo, 1979) and widely accepted measure of intrinsic motivation (Wilson, Hull, & Johnson, 1981). To minimize possible Ziegarnik (1927) effects, we did not count time spent on models that had been partially completed during the experimental session (cf. Mossholder, 1980; Pinder, 1976).

RESULTS

Manipulation Checks

Subjects' responses to the questions on goal difficulty, goal-setting method, and external evaluation were analyzed with a $2 \times 2 \times 2$ ANOVA. Only the expected main effects were significant. The manipulation for goal difficulty had a significant effect on the index of goal difficulty ($F_{1,88} = 71.1$, $p < .01$). Subjects with a difficult goal ($\bar{x} = 5.11$, s.d. = 1.46) perceived it as more difficult than those with an easy goal ($\bar{x} = 2.82$, s.d. = 1.28). The manipulation for goal-setting method had a significant effect on the method index ($F_{1,88} = 53.7$, $p < .01$). Subjects in the participation condition ($\bar{x} = 5.57$, s.d. = 1.07) felt they had more influence over the goal that was set than subjects in the assigned condition ($\bar{x} = 3.54$, s.d. = 1.55). The expected evaluation condition had a significant effect on the evaluation index ($F_{1,88} = 11.1$, $p < .01$). Individuals who expected an evaluation ($\bar{x} = 5.24$, s.d. = 1.17) scored higher on the index than those who did not expect an evaluation ($\bar{x} = 4.35$, s.d. = 1.39).

Consistent with results reported for previous research (Campbell & Gingrich, 1986; Latham & Saari, 1979; Shalley & Oldham, 1985), results of a three-way ANOVA indicated that none of the experimental manipulations had a significant effect on the index of goal acceptance. A high mean acceptance score ($\bar{x} = 5.92$, s.d. = 2.07) across all conditions suggests that subjects accepted goals under all eight experimental conditions.

Intrinsic Motivation

To test Hypotheses 1 and 2, we performed a three-way ANOVA with intrinsic motivation as the dependent variable. Table 1 presents the results of those analyses, and Table 2 presents cell means and standard deviations. Results only show a significant main effect for goal-setting method, thus providing no support for the hypotheses. Subjects who were assigned goals exhibited significantly higher levels of intrinsic motivation than those who participatively set goals. No other significant main effects or interactions emerged.

One possible explanation for the effects of goal-setting method is that subjects attained assigned goals more frequently than participatively set goals, resulting in higher intrinsic motivation for those in the assigned condition. To test that possibility, we crossed goal attainers and nonattainers with the assigned and participative conditions and performed a chi-square test. No significant results emerged, suggesting that the goal-setting method had no effect on goal attainment. To further examine effects of goal attainment on intrinsic motivation, we performed a 2×2 ANOVA for attainment versus nonattainment and assigned versus participative goal. Results showed a main effect for goal-setting method ($F = 5.41$, $p < .05$) but no other main or interaction effects. These results suggest that the method of setting goals affects intrinsic motivation directly and that simply attaining a goal has little effect.

One final analysis was conducted to supplement our findings. Calder and Staw (1975) suggested that differences in free time spent on a task could be due to differences in subjects' performance during the experimental period. High performers may choose to spend little free time on a task because of fatigue rather than loss of intrinsic motivation. To test that idea, we performed a three-way ANCOVA, using task performance as a covariate. Results were basically identical to those reported above, suggesting that differences in task performance do not explain the results obtained in this study.

Performance

To replicate the results of previous studies that examined the effects of goal difficulty, goal-setting method, and expected evaluation, we performed a three-way ANOVA with performance as the dependent variable. Tables 1 and 2 show the results. Consistent with previous research (Jackson & Zedeck, 1982; White et al., 1977), subjects expecting an external evaluation performed at higher levels than subjects expecting no evaluation. Results also show a significant main effect for goal difficulty, qualified by a significant interaction between that variable and goal-setting method. Comparisons among the means with Newman-Keuls tests indicated that subjects in the assigned/difficult goal condition ($\bar{x} = 329.96$) performed at significantly higher levels ($p < .05$) than subjects in the assigned/easy condition ($\bar{x} = 271.50$). No other significant differences were obtained.

TABLE 1
Summary of Analyses of Variance
for Task Performance and Intrinsic Motivation

Sources	df	MS	F
Task Performance			
Goal-setting method (A)	1	54.00	.01
Expected evaluation (B)	1	22,878.38	6.25**
Goal difficulty (C)	1	17,066.67	4.67*
A × B	1	1,014.00	.27
A × C	1	24,257.04	6.63**
B × C	1	1,120.67	.30
A × B × C	1	117.04	.03
Error	88	3,658.78	
Intrinsic motivation			
A	1	108,474.26	4.97*
B	1	29,715.84	1.36
C	1	9,381.26	.43
A × B	1	6,128.01	.28
A × C	1	10,437.51	.48
B × C	1	98.01	.00
A × B × C	1	3,516.26	.16
Error	88	23,964.45	1.10

*p < .05
**p < .01

TABLE 2
Cell Means and Standard Deviations
for Task Performance and Intrinsic Motivation

Experimental Conditions	Difficult Goal			Easy Goal		
	Participative	Assigned	Overall	Participative	Assigned	Overall
Task performance						
Evaluation						
Means	313.83	339.83	326.83	328.00	286.00	307.00
Standard deviation	51.71	48.10	50.61	78.34	64.75	73.49
No evaluation						
Means	285.50	320.08	302.79	281.58	257.00	269.29
Standard deviation	69.98	40.42	58.61	66.99	54.17	60.89
Overall						
Means	299.67	329.96		304.79	271.50	
Standard deviation	61.89	44.60		75.12	60.24	
Intrinsic motivation						
Evaluation						
Means	129.58	179.83	154.71	74.83	191.00	132.92
Standard deviation	170.25	188.33	177.44	98.98	189.18	159.13
No evaluation						
Means	96.25	138.75	117.50	69.75	129.75	99.75
Standard deviation	131.55	128.53	129.03	91.91	148.93	124.85
Overall						
Means	112.92	159.29		72.29	160.38	
Standard deviation	149.76	159.08		93.45	169.42	

DISCUSSION

Results of this study indicate that only the method of setting goals has an effect on individuals' intrinsic motivation to perform a task.[2] Individuals who were assigned goals exhibited significantly higher levels of intrinsic motivation than those who participated in setting goals. Goal difficulty and expected external evaluation had no effect on the measure of intrinsic motivation.

Since external evaluation and goal difficulty had no effect on intrinsic motivation, this study failed to replicate the earlier Shalley and Oldham (1985) study. One possible explanation involves differences in the goal-difficulty manipulation used in the two studies. In the current study, subjects were told their practice times and what percentage of the practice time the goal represented. In those circumstances, failure to achieve the goal and expecting negative feedback for nonattainment may have had little effect on intrinsic motivation, since subjects were able to contrast their goal performance with alternative standards based on performance in a practice trial.

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[2] Since only men participated in this study, it is possible that our results apply only to men. Future research is needed to examine the extent to which men and women differ in their reactions to the experimental conditions.

On the other hand, in the earlier study, subjects assembled a different type of model during the practice period, and goal levels were based on the goal-attainment figures of a pilot group. Thus, subjects may not have had suffic-ient information to establish personal performance standards, causing an adverse reaction to expected negative feedback during the experimental session.

The results involving goal-setting method were inconsistent with predic-tions and with suggestions theorists have made about intrinsic motivation (e.g., Deci, 1980; Manderlink & Harackiewicz, 1984). We expected that participatively setting goals would enhance individuals' feelings of personal control and boost intrinsic motivation, especially when goals were easy and an evaluation was expected. Although the results of the manipulation check indicated that individuals in the participation condition experienced more personal control over their goals than individuals in the assigned condition, those feelings of control contributed little to intrinsic motivation. Rather, it is possible that participating in establishing a goal caused individuals to focus their attention on the goal itself instead of on the task. Intrinsic motiva-tion might have decreased as a result. Another possibility is that individuals in the participation condition became intrinsically interested in the partici-pation process at the expense of their interest in the task. Finally, goal-setting method may have had an effect on individuals' perceptions of the causes of their performance (Chacko, Stone, & Brief, 1979; Dossett & Green-berg, 1981). When goals were participatively set, individuals may have attri-buted their performance to an external or nonpersonal cause. On the other hand, individuals may have attributed their performance to internal factors like ability or effort when goals were assigned to them (Chacko et al., 1979). It is possible that such internal attributions contributed to the rather high intrinsic motivation levels observed in the assigned goal-setting condition. Research is now needed to systematically examine which of these possibil-ities is useful in explaining the effects of goal-setting method on intrinsic motivation.

The results involving task performance were generally consistent with the results of previous research. Individuals performed at higher levels when they expected an external evaluation than when they did not, thus replicat-ing the results of Jackson and Zedeck (1982) and of White and his colleagues (1977). Also, level of goal difficulty and method of goal setting interacted to affect performance. The highest performers in our study were those assigned difficult goals, and the lowest performers were those assigned easy goals. However, again consistent with previous research (Latham & Marshall, 1982; Latham & Saari, 1979), within goal-difficulty levels there was no significant difference between individuals who were assigned goals and those who participatively set goals.

In light of all those results, our study calls into question the general effectiveness of participation as a goal-setting strategy. Unlike commentators who argue that participation is an effective way to enhance goal acceptance and performance (e.g., Earley & Kanfer, 1985; Erez, Earley, & Hulin, 1985;

Erez & Kanfer, 1983), we found that participative goal setting had no positive effect on either of those measures and had an adverse effect on individuals' intrinsic motivation to perform a task. One explanation for the conflicting results involves the experimental tasks used in the studies. Our study used a simple assembly task, but the studies by Earley, Erez, and their associates used a more complex simulated course-scheduling task. Research is now needed to determine if type of task has an effect on individuals' reactions to participative goal setting. Work is also needed to investigate the long-term effects of participative and assigned goal setting on performance and intrinsic motivation and to examine the possible effects those practices might have on other individual reactions like creativity and innovation in work settings.

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APPENDIX

Subjects responded to all questionnaire items on a 7-point scale that ranged from 1 = strongly disagree to 7 = strongly agree. The items measuring individuals' perceptions of participation were: (1) I felt I had a great deal of influence over setting my performance goal, (2) Compared to the experimenter, I felt I had a lot of influence over the performance goal that was set, (3) I had no input into the decision of how many models I should try to construct (reverse-scored) and (4) The experimenter decided on my performance goal without listening to my opinion (reverse-scored).

The items measuring goal difficulty were: (1) The performance goal was very easy (reverse-scored) and (2) I found the performance goal very difficult.

The external evaluation items were: (1) My performance was measured and compared to others, (2) I felt as though my performance on this task was to be evaluated, and (3) I felt as though I was competing with others on this task.

The goal acceptance items were: (1) I felt I had a high degree of personal investment in completing the performance goal, (2) I was committed to attaining the performance goal, (3) I had a production goal to meet on this task, and (4) Attaining the performance goal was important to my feelings of achievement and accomplishment.

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STRUCTURE AND IMPORTANCE OF WORK GOALS AMONG MANAGERS IN THE PEOPLE'S REPUBLIC OF CHINA

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Despite the growing body of knowledge on the cross-national distribution of managerial styles and employees' attitudes about work, the debate on the occurrence of convergence or divergence of attitudes across cultures (Webber, 1969) and on the processes leading to either phenomenon has not subsided (Ronen & Shenkar, 1985). The assumption that processes common to all development and industrialization lead to universal attitudes about work regardless of national or cultural context has anchored support for the idea of convergence (Ronen, 1986). On the other side, the assumption that underlying values and belief systems produce significant differences in employees' expectations and work attitudes sustains the argument for divergence (Hofstede, 1980). Lack of access to information on societies that represent the sharpest contrast to the Western democracies—and therefore pose the greatest challenge to Western paradigms of work attitudes—has hampered establishment of an empirical base for that debate. This study sought to provide some preliminary information on work attitudes in one such society, the People's Republic of China.

The People's Republic belongs to a group·of predominantly Chinese nations whose workers, according to previous research (Redding, 1976), frequently display work values different from those of Western workers. Investigators have presumed that these values are rooted in traditional Chinese philosophies, primarily Confucianism, which may explain why Taiwan, Hong Kong,[1] and Singapore are frequently used as proxies in studies referring to China (e.g., Hofstede, 1980). However, the People's Republic of China is a developing nation, with a per capita gross national product and income far below those of the other Chinese countries. Furthermore, while those other countries have had extensive rapport with the West over the last decades, the People's Republic has been largely isolated for many years. Despite recent developments, many of which are confined to specially designated zones, a unique social ideology challenging basic Western assumptions on management and organization still characterizes the People's Re-

[1] Hong Kong is of course not a nation, but for simplicity's sake, we have included it in that category for purposes of cross-cultural comparison.

public (Laaksonen, 1984; Whyte, 1973). This combination—traditions shared with other predominantly Chinese countries and a unique ideological and economic system—makes the present data on that nation an important contribution to the debate on convergence versus divergence.

METHODS

Respondents and Procedures

The study used data from 163 managers who participated in a management training program delivered by scholars from the United States in the People's Republic in 1982. All were men and most were between 40 and 50 years old; they were middle-level government officials, enterprise managers, or members of the administrative staff of the academy of science in the People's Republic. Their government had selected them for the program. All 163 men responded to a questionnaire eliciting data on 14 work goals, presented in the Appendix, with response possibilities on a 5-point scale. The original questionnaire in English, developed by Hofstede, Kraut, and Simonetti (1977), appears in a previous study (Ronen, Kraut, Lingoes, & Aranya, 1979: 392), and several cross-cultural studies have used it (Hofstede, 1980; Ronen, 1979; Ronen & Kraut, 1977; Sirota & Greenwood, 1971). Two goals in the original questionnaire, skills and living in a desirable area, were replaced in the Chinese version with efficiency and contribution. The goal of acquiring new skills was included in the training goal, while living in a desirable area was omitted as a meaningless goal in the context of the People's Republic at that time. Two different teams translated the questionnaire into Chinese, with a bilingual Chinese social scientist from the People's Republic deciding on the final version. That version, translated back into English, was satisfactory in terms of similarity to the original version.

Two concerns about the respondents and procedures must be noted. First, the group of respondents cannot be considered representative of all managers in the People's Republic of China and is thus sensitive to neither demographic and organizational variables nor to variations in cultural, economic, and social conditions throughout that nation. However, since government authorities chose them for the program, they were probably considered to be exponents of an ideologically correct line and would be unlikely to simply internalize their U.S. teachers' work attitudes. Also, data were collected in the beginning of the training program.

A second concern is the use of a Western instrument in an East-Asian country (Maryuma, 1974; Watts, 1961). For instance, the lack of clear delineation of boundaries marking individual psychological space in the Confucian psychic process (Metzger, 1977) could mean that questions based on individual dispositions do not adequately reflect the attitudes of Chinese people. However, culture-specific instruments have yet to be developed and tested, and the use of a standard questionnaire allowed for the cross-cultural comparisons we intended.

Data Analysis

Analysis was carried out in two stages, the first intended to identify the underlying cognitive structure of respondents' work goals and the second to determine the relative importance assigned to the various work goals in the People's Republic and in other Chinese countries.

To identify the cognitive structure of work goals, we employed both factor analysis and a nonmetric multivariate technique called smallest space analysis (SSA) (Guttman, 1968; Lingoes, 1965) that provides information on relations between clusters that factor analysis does not provide. Validation of hypotheses in SSA depends on how well an empirically based map can be partitioned into contiguous regions that correspond to the sections of a structure hypothesized a priori. A statistical test, the coefficient of alienation, represents the correspondence of the Euclidian distances to the correlations.

The second stage of analysis examined the relative importance of work goals by transforming them into standardized scores to make them comparable to the scores from Taiwan, Singapore, and Hong Kong reported by Hofstede (1980).[2] We determined the consistency among the rankings of work goals made by individuals in the different Chinese countries by using a Kruskal-Wallis one-way ANOVA, a Mann-Whitney U-test, and Spearman correlation coefficients.

To determine the significance of differences in scores among the various Chinese countries across each work goal, we applied the following procedure. First, available standard deviation data for the People's Republic was chosen as a base line against which we could test the statistical significance of the between-groups mean squares after adjusting them for number of respondents and degrees of freedom. This assumption of homogeneity in subgroup variances is similar to that made in fixed-effects one-way ANOVA models. Second, we performed an omnibus F-test of subgroup differences for each work goal by (1) examining F-statistics based on the entire population at 3 and 276 degrees of freedom ($p = .05$), and (2) by computing R^2 as a linear function of F whenever F is significant (Cohen, 1969, 1973). The third and final step was to apply a Dunn-Bonferroni a priori multiple comparisons t-test (Kirk, 1968; Miller, 1966) to assess all pairwise comparisons. We then established critical t-values using a normal variate transformation procedure (Kirk, 1968) in which a value for alpha is divided equally among all pairs; thus, t-values for all six contrasted pairs were set at the .008 level (.05/6).

RESULTS AND DISCUSSION

Underlying Structure of Work Goals

Table 1 presents the means, standard deviations, and intercorrelational matrix of work goals for the respondents, and Table 2 presents results of the factor analysis. We extracted four factors with eigenvalues greater than 1.

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[2] Hofstede's population included 88 managers from Hong Kong, 71 from Taiwan, and 58 from Singapore.

TABLE 1
Means, Standard Deviations, and Intercorrelations[a] for All Work Goals

Variables	Means[b]	Standard Deviations	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Earnings	2.73	1.04													
2. Security	2.75	1.21	20												
3. Benefits	2.81	1.01	34	35											
4. Time for nonwork activities	3.30	1.00	36	16	39										
5. Co-workers who cooperate	1.78	0.79	−09	08	14	01									
6. Autonomy	1.95	0.83	−07	00	−09	−02	24								
7. Efficiency	2.08	0.92	−25	−02	08	00	20	28							
8. Training	2.06	0.88	−16	11	09	−06	23	18	31						
9. Making a contribution	1.60	0.72	−23	−01	−11	−16	09	31	23	22					
10. Favorable physical conditions	2.84	0.93	08	28	31	31	11	09	10	23	08				
11. Recognition	2.78	1.03	21	16	21	12	−01	17	15	16	14	24			
12. Challenge	2.41	1.12	−02	08	−09	−03	−06	36	24	16	42	05	36		
13. Promotion	3.20	1.07	25	15	11	18	−03	17	09	19	14	18	57	43	
14. Working relationship with manager	2.58	0.99	01	20	17	10	30	03	19	17	05	24	36	16	38

[a] All correlations above 0.14 are significant at p < .05; all correlations above 0.18 are significant at p < .01; n = 163. Decimals omitted.
[b] Lower means signify higher scores.

TABLE 2
Results of Factor Analysis of Work Goals for Managers
in the People's Republic of China[a]

Variables	Factor 1: Basic	Factor 2: Progress	Factor 3: Actualization	Factor 4: Team
Earnings	.534	.276	−.234	−.425
Security	.537	.200	.063	.126
Benefits	.801	−.007	−.063	.127
Time for nonwork activities	.722	.046	−.016	.105
Favorable physical conditions	.556	.129	.179	.301
Recognition	.231	.746	.202	.022
Promotion	.147	.832	.168	.032
Working relationship with manager	.088	.626	−.173	.579
Challenge	−.064	.528	.606	−.187
Making a contribution	−.124	.113	.702	.062
Autonomy	−.001	.088	.697	.090
Efficiency	.065	−.026	.528	.420
Training	.115	.091	.352	.509
Co-workers who cooperate	.071	.048	.025	.726
Eigenvalues	3.08	2.22	1.55	1.02
Percentage of variance explained	22	16	11	7

[a] Varimax rotation; $n = 163$. Labels of factors describe corresponding regions of SSA map; see Figure 1.

The work goals of higher earnings, security, benefits, time for nonwork activities, and favorable physical conditions load on the first factor. The second factor contains high loadings on recognition, promotion, challenge, and working relationship with manager. The third factor has high loadings on autonomy, making a contribution, efficiency, and challenge; and the fourth factor has high loadings on co-workers who cooperate, working relationship with manager, training opportunities, opportunities for higher earnings, and efficiency.

The factorial structure is similar to those of classical motivational taxonomies (Alderfer, 1969, 1972; Herzberg, Mausner, & Snyderman, 1959; Maslow, 1943). As Figure 1 shows, the SSA map in this case replicates the factorial structure. However, it provides additional information on the relative proximity of the clusters and the relative position of each work goal. The boundaries drawn on the SSA map correspond to the results of the factor analysis. Included in each region are all the work goals with loadings above .40; discontinuous lines represent secondary loadings. It should be emphasized that the order of the factors in the factor analysis—and therefore the corresponding designation on the SSA map—is not a result of the level of

FIGURE 1
An SSA Plot of Work Goals for Managers
from the People's Republic of China[a]

I-BASIC

Security

Physical
Conditions

Benefits

Nonwork Time

Earnings

II-PROGRESS

Manager

Recognition

Promotion

IV-TEAM

Co-workers

Training

III-ACTUALIZATION

Efficiency

Autonomy

Contribution

Challenge
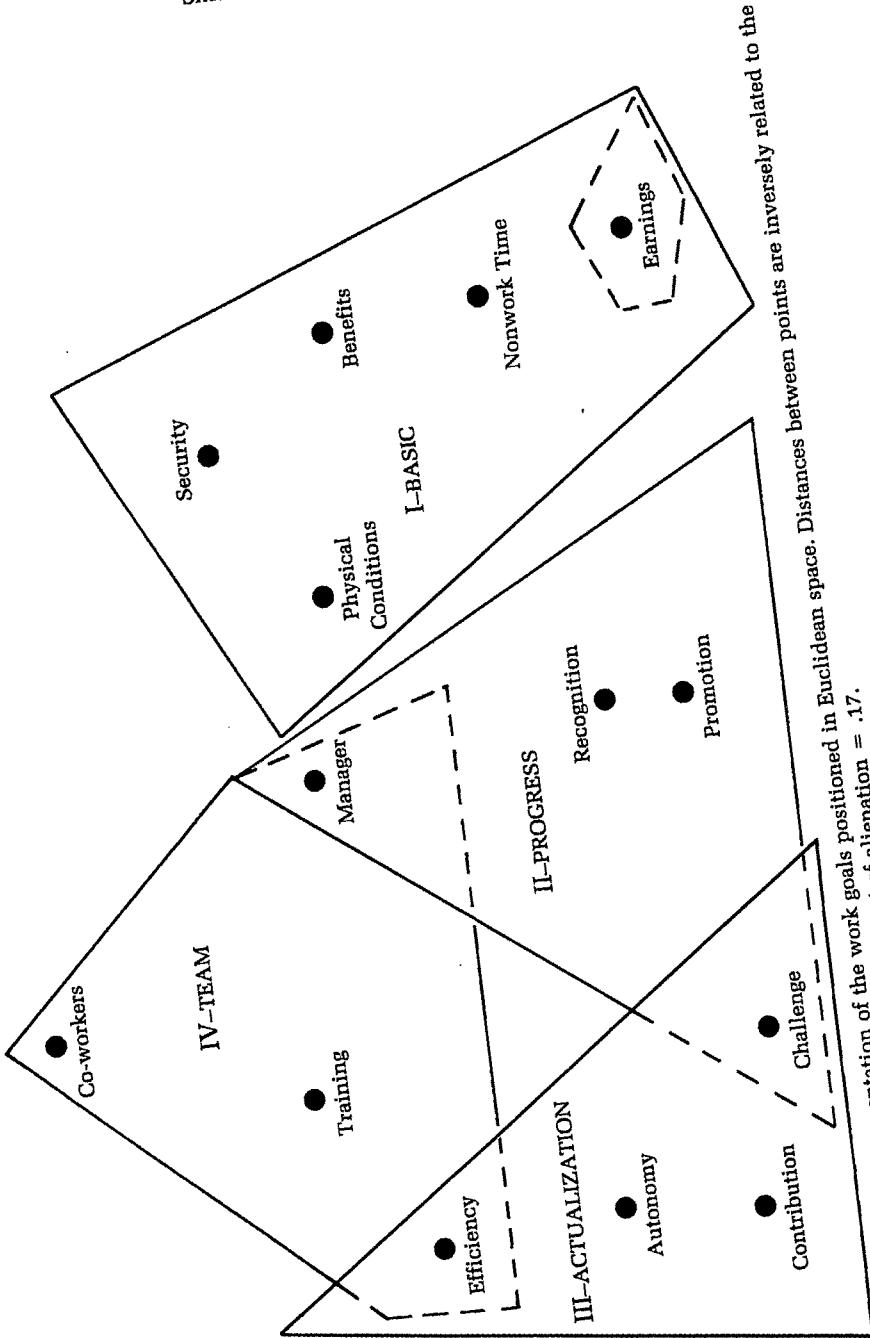
[a] Points are a geometric representation of the work goals positioned in Euclidean space. Distances between points are inversely related to the similarity coefficients among them; n = 163, coefficient of alienation = .17.

importance of a group of values, but rather of the order of the factors established by the percentage of variance for which the items account. This order could be attributed to the number of items in the particular cluster.

When compared with SSA maps of other countries, the present SSA map displays some unique aspects. First, unlike the maps of countries that have been studied (Ronen, 1979; Ronen & Kraut, 1980), the map for the People's Republic includes the training goal in the team (IV) region. Second, the goal of having co-workers who cooperate is not situated between low- and high-order need categories, also a departure from the SSA maps of other countries. The importance of teams and the collective in Chinese society and their centrality in both traditional and modern ideologies may explain this finding. Third, the efficiency goal appears not only in the actualization region (III) but also in the team region (IV), which implies that although respondents regarded efficiency as a high-order goal, they perceived its achievement to be tied to a team effort.

Fourth, the goal of having a good working relationship with the manager appears not only in the team region (IV), but also in the progress region (II), hinting that the managers served as "linking pins." A concept ingrained in Confucian ideology (Hsiao, 1979), a linking pin refers to a manager's role in mediating the effects of work environment on employees. Mayo (1949) observed Chinese managers playing that role in a plant in prerevolutionary China where, during World War II, unsatisfactory relations between workers and supervisory officers led to general discontent despite other positive aspects.

Fifth, although SSA maps for West Germany, Canada, Britain, and France show the goal of higher earnings on or about a border line between intrinsic and extrinsic goals (Ronen, 1979), thus representing both a basic need and a symbolic value, in the SSA plot for the People's Republic of China it is clearly an extrinsic goal. Unquestionably, economic conditions affected the finding: for many years wage differences have had little impact in that country as all necessities were priced very low and luxury goods, if available at all, were priced very high (Eckstein, 1975). However, cultural and ideological factors also probably played an important role. One Chinese word for incentive, *cushi*, indicates an emphasis on intrinsic motivation. The word, as Andors (1977, 1974) suggested, "has the connotation of inciting or provoking into action; behind the definition is a morality or state of mind embodying one's inclinations, even in the absence of external stimuli, which is only a trigger for doing what one is anyway disposed to do" (1977: 225). Neither Confucianism nor Maoism advocates earnings as an intrinsic motivator (Confucius, 4:16, 5:12, 8:12, 14:13, 15:31, 15:37; Hsiao, 1979). Mao Zedong believed that material incentives would encourage pursuit of individual interests, personal possessions, power, and privilege (Andors, 1977; Eckstein, 1975; Oh, 1976; Whyte, Vogel, & Parish, 1977); reduce personal initiative (*China News Summary*, 1975); and require an immense control apparatus (Andors, 1974). Economic incentives, particularly bonuses, fell under strong attack during the Cultural Revolution (*Peking Review*, 1978, 1979; Starr,

1979). They have been restored thereafter and in recent years have played an increasingly important role in enterprises in the People's Republic of China (Tung, 1980, 1982).

Work Goals' Importance in a Comparative Perspective

Comparing the relative importance of the various work goals in the People's Republic and in other predominantly Chinese countries can shed light on the differential impact of traditional culture on the one hand and modern ideology and economy on the other. Table 3 presents standardized scores for the importance of work goals for the People's Republic, Hong Kong, Taiwan, and Singapore. A Kruskal-Wallis one-way ANOVA yielded a corrected-for-ties chi-square of .559 with a .906 level of significance; noncorrected scores were basically identical. A Mann-Whitney U-test also yielded nonsignificant scores in all cases. However, Spearman rank-order correlation coefficients indicated that the other, non-Communist Chinese countries are more similar to each other in their rankings than they are individually to the People's Republic: for Taiwan and Hong Kong, $r = .85$, $p <$ .001; for Singapore and Hong Kong, $r = .94$, $p < .001$; and for Singapore and

TABLE 3
Standardized Scores on Work Goals for Managers from Four Countries[a]

Variables	People's Republic of China	Hong Kong	Taiwan	Singapore
Making a contribution	671	—	—	—
Co-workers who cooperate	635	579	571	624
Autonomy	603	512	480	532
Training	583	596	657	611
Efficiency	578	—	—	—
Skills	—	555	577	536
Challenge	515	548	548	571
Working relationship with manager	483	522	524	551
Earnings	454	567	442	552
Security	450	452	506	437
Recognition	446	487	487	442
Benefits	439	323	363	439
Area	—	477	438	362
Favorable physical conditions	433	436	407	432
Promotion	364	640	630	593
Time for nonwork activities	345	307	372	318

    [a] Data, except for the People's Republic, are from Hofstede (1980). For the variables for the People's Republic we included the skills goal in the training goal; the area goal is irrelevant in the context of the People's Republic.

Taiwan, r = .82, p < .001; on the average, r = .87. In contrast, all correlations between scores for the People's Republic and those for the other countries are substantially lower and not significant at the .001 level: for that nation paired with Taiwan, r = .49, p < .054; with Singapore, r = .64, p < .013; and with Hong Kong, r = .50, p < .051; on the average, r = .54. The two groups of correlations tentatively suggest that a common thread runs through all Chinese countries, reflecting the cultural tradition they all share. At the same time, the differences between the two groups of correlations indicate that the People's Republic of China differs more from the non-Communist Chinese countries than they differ from each other.

The multiple comparisons Dunn-Bonferroni *t*-test, employed to detect differences *across* each work goal, revealed that the scores for the People's Republic are less similar to those of the other countries than are scores among those countries: 16 out of 36 paired comparisons involving the People's Republic and other Chinese countries are statistically significant, versus only 6 out of 36 among the three non-Communist Chinese countries. It is more interesting, however, to look separately at (1) those goals on which no Chinese country significantly differed from the others, and (2) those goals on which the People's Republic differed from the others. We selected three goals in the first category and three goals in the second and attempted to account for the findings in cultural and ideological terms.

Three goals on which the Chinese countries do not significantly differ are challenge, nonwork time, and recognition. In the West, challenge is associated with achieving a sense of accomplishment and the enhancement of self-image through employing cognitive abilities. In Chinese countries—including Mao's China—boundaries between self and others are unclear (Metzger, 1977). Challenge therefore becomes less a personal goal and more a collective endeavor (Whyte, 1974).

The People's Republic is also similar to other Chinese countries in the low importance assigned to sufficient time for personal and family life. This finding may look surprising considering the great importance of family obligations in Chinese tradition (Confucius, 2:21, 8:10; Lee, 1954), but not when time as a goal is viewed as choice between work and leisure time rather than between work and family. Chinese tradition views work as clearly more important than leisure and as contributing to family welfare instead of competing with it (Eberhard, 1971; Metzger, 1977). A study of Chinese university students in Hong Kong found that the traditional value of intensive work in contrast to the modern desire for leisure ranked as one of the most important values (Dawson, Law, Leung, & Whitney, 1971). An earlier study reported similar results regarding emphasis on duty rather than enjoyment among the Chinese in Hong Kong (Morris, 1956). In the People's Republic, both Maoist ideology and economic necessity reinforced those values, which explains the similarity of scores.

The third work goal whose importance does not vary significantly among all the Chinese countries is recognition. Chinese tradition is overwhelmingly opposed to individual glorification and sees anyone who desires personal

aggrandizement as a threat to the collective (Pye, 1982). The opposition to individual recognition goes so far that group members in all predominantly Chinese countries need to reassure their colleagues that they are not seeking to promote personal interests at the group's expense (Shenkar & Ronen, 1987). In this case, Maoist ideology was in complete accordance with traditional beliefs (Eberhard, 1971; Whyte, 1974). In his famous "twenty manifestations of bureaucracy," Mao attacked those who "want fame and fortune" (1970: 42) and "attribute merit to themselves" (1970: 40). This concordance of traditional culture and Maoist ideology may explain why differences among all the Chinese countries on the recognition goal were insignificant.

Three work goals on which the People's Republic and the other Chinese countries differed significantly are autonomy, co-workers who cooperate, and promotion. Maoist ideology may explain the differences in the importance assigned to those goals in Hong Kong, Taiwan, and Singapore on the one hand and the People's Republic on the other. Developed during his guerrilla struggle in Yenan, Mao's emphasis on autonomy went far beyond both the importance autonomy has in Confucianism (Starr, 1979) and a leader's typical wish for autonomous performance among subordinates. He expected officials not only to interpret but also to modify and adapt policy (Selden, 1971; Tang, 1951). Mao also specified that when "appointing people on their merit," a person's ability "to find his bearing independently" must be weighed (1966: 202). Mao's fierce attack during the Cultural Revolution on those "who do not have a mind of their own" (1970: 42) and are "yes-men to those above them" (1970: 40) suggests that his hopes for an increase in autonomy were not fulfilled. In the highly centralized system of the People's Republic, middle managers have had minimal leeway in deciding how to run their enterprises (Laaksonen, 1984). Prospects for a new system in which managers of enterprises would be given much higher autonomy prevailed during the period in which the present survey was taken, and the expectations those prospects created may have contributed to autonomy having higher importance as a goal for managers in the People's Republic than it did for other Chinese workers.

Although other Chinese countries share the Confucian emphasis on harmony, cooperation, loyalty, and reciprocity (Reischauer & Fairbank, 1960), Maoist ideology emphasizes cooperation among co-workers more than the other qualities (Eberhard, 1971; Oh, 1976). Such cooperation and collectivism were considered an important incentive for cadres in the People's Republic who, "by accepting responsibility for others' well-being, had to perceive the same concern for equality in the others' actions" (Andors, 1977: 22). Confucianism does not so strongly emphasize this concern for lateral cooperation, which may explain the difference between the People's Republic and the other Chinese countries in the assessment of the goal of having co-workers who cooperate.

The discrepancy between Confucian and Maoist ideologies is more significant regarding promotion than any other goal (Eberhard, 1971). "Elevating the worthy" was a central concept in Confucian China. Special clothes and

colors accompanied each rank, marking advancement in the imperial bureau-
cracy (Lee, 1954). Mao was fiercely opposed to this hierarchy, claiming that
"to each according to his worth" and "the contest for rank" were "remnants
of bourgeois ideology" (Starr, 1979: 125), and he attempted to abolish hierar-
chy by denouncing the use of special clothes and managerial titles by highly
ranked individuals (Andors, 1977). Since promotion hardly resulted in more
authority and autonomy (Laaksonen, 1984) and brought only meager finan-
cial rewards (Tung, 1980), it became a negligible goal to employees in the
People's Republic. The low importance of promotion may also reflect a fear
that in a politically volatile environment, initiative may be risky. This fear
may have serious repercussions for the current drive in the People's Repub-
lic of China to promote young technical managers to positions of authority.

Although some unique patterns emerged, the groupings of work goals
among managers from the People's Republic of China appear to be generally
in line with the groupings found for other Chinese countries. The present
findings cannot resolve the convergence-versus-divergence debate, but they
seem to suggest that looking at partially similiar nations can make an impor-
tant contribution to that debate.

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APPENDIX

We used the following items, with a 5-point response format, to elicit data on work goals. Respondents were asked: How important to you is it to . . . (1) have favorable physical working conditions (good ventilation and lighting, adequate work space, etc.)? (2) have a job which leaves you sufficient time for your personal or family life? (3) have the security that you will be able to work for your company as long as you want to? (4) have good fringe benefits? (5) have an opportunity for high earnings? (6) have co-workers who cooperate well with one another? (7) have a good working relationship with your manager? (5) get the recognition you deserve when you do a good job? (9) work in a department which is run efficiently and accomplishes its tasks? (10) have the opportunity for promotion to higher level jobs? (11) have training opportunities (to improve your skills or to learn new skills)? (12) have considerable autonomy to adopt your own approach to the job? (13) have a job which allows you to make real contribution? (14) have challenging work to do—work from which you get a personal sense of achievement?

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EFFECTS OF TRANSACTIONAL FORM
ON ENVIRONMENTAL LINKAGES
AND POWER-DEPENDENCE RELATIONS

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In recent years, the concepts of environmental linkages and power-dependence relations have been increasingly important topics in the organizational literature. Most published studies have examined not-for-profit institutions like the United Way, universities, and government agencies (e.g., Aldrich, 1979; Pfeffer & Leong, 1977; Pfeffer & Salancik, 1978; Provan, 1980, 1982; Provan, Beyer, & Kruytbosch, 1980; Salancik & Pfeffer, 1974). Recent research has extended the study of environmental linkages and power-dependence relationships to a for-profit setting consisting of manufacturers and their dealers (Skinner & Guiltinan, 1985, 1986).

The present study further extended previous research by examining those relationships in three manufacturer-dealer networks, each with a different *transactional form;* the term refers to the vertical economic arrangements between manufacturers, wholesalers, and dealers (Reve & Stern, 1979). No previous reported empirical study has examined the variance in environmental linkages and power-dependence relationships across transactional forms.

BACKGROUND

In a manufacturer-dealer network, exchanges may occur between parties owned by one organization, between a series of independently owned and managed organizations, or on a contractual basis between two independently owned organizations. These three transactional forms are respectively called corporate, conventional, and contractual networks (Stern & El-Ansary, 1982).

Corporate networks exist when parties on different levels of distribution for a particular product are owned or operated by one organization. Through ownership, an organization can "achieve operating economies and *absolute* control of the marketing activites" of other parties (Stern & El-Ansary, 1982: 347).

Conventional networks are comprised of autonomous organizations, each performing a defined set of functions. Firms at one level, such as wholesalers, only concern themselves with distribution of a product to the next level—retailers, for example (Etgar, 1976a). The amount of influence exercised by

the participants in such a network is less than in other types of networks because firms can enter and exit fairly easily (Williamson, 1975).

In a contractual network, organizations seek to achieve coordination by formalizing roles within their networks through contractual agreements. Decisions are generally formalized, as in a franchise system, with independent parties trading some degree of autonomy to gain needed inputs. A relative power advantage is often programmed through a contractual arrangement (Hunt & Nevin, 1974).

It is apparent that the amount of the parties' control can vary with transactional form. Thus, examining differences in transactional form may be important in developing a more accurate picture of environmental linkages and power-dependence relations.

HYPOTHESES

Dealers' Dependence and Power

Researchers who have studied interorganizational relations from the resource dependence perspective have argued that power-dependence relations between organizations are based on the exchange of resources (Aldrich, 1979; Cook, 1977; Emerson, 1962; Pfeffer & Salancik, 1978). Many others have substantiated that relationship in studies of the United Way (Pfeffer & Leong, 1977; Provan et al., 1980), a distribution system for independent insurance agencies (Etgar, 1976b), and a manufacturer-dealer chemical distribution network (Skinner & Guiltinan, 1986). The proportion of variance in power explained by dependence in those studies has been inconsistent, ranging from 6 to 45 percent. Differences in transactional form may account for that inconsistency.

Although the effects of transactional form on relations between power and dependence have not been examined, previous research has suggested that different forms of agreements can effect organizational relationships. Hall, Clark, Giordano, Johnson, and Van Roekel (1977) found that patterns of interorganizational coordination depend on whether an interaction is voluntary or based on a formal agreement or legal mandate. Likewise, Provan (1983), in discussing the federation as a type of interorganizational linkage network, argued that substantial differences exist among participatory, mandated, and independent federations, and that those differences will influence interorganizational relationships.

Although the present study dealt with neither federations nor interorganizational coordination, the context of transactional form is similar. In many corporate networks, dealers rely on a manufacturer as the sole supplier of resources and are therefore highly dependent (Stern & El-Ansary, 1982). In a conventional network, dealers are autonomous, are not bound to a manufacturer through contract or ownership, and therefore are not highly dependent on a manufacturer for resources (El-Ansary & Stern, 1972). In a contractual network, dealers are dependent on a manufacturer for resources as a result of a legal obligation to engage in certain exchanges with the manufacturer (Hunt & Nevin, 1974; Skinner & Guiltinan, 1985).

> *Hypothesis 1: The amount of a dealer's dependence, and therefore of a manufacturer's influence, is lower in conventional networks than in contractual or corporate networks.*

Environmental Linkages and Power

An organization can reduce the extent to which a single resource supplier influences it by developing linkages with elements of its environment (Benson, 1975; Kotter, 1979) and by firmly establishing itself within its environment (Aldrich & Pfeffer, 1976). This study investigated several variables that have previously been linked to resource dependence and are relevant in a manufacturer-dealer network, including linkages with other organizations, relationships with customers and elites, degree of establishment in a domain, and organizational size.

Benson (1975) argued that organizations develop linkages with other organizations in an attempt to acquire power. Other researchers have postulated that joint ventures can be used to maintain an organization's autonomy (Aiken & Hage, 1968; Jacobs, 1974; March, 1962; Pfeffer & Nowak, 1976). Pfeffer and Leong (1977) reported that power was a function of both a United Fund agency's ability to attract outside resources and the importance of an agency to the fund. Litwak and Hylton (1962) found that agencies with the ability to develop alternative bases of funding were able to resist affiliation with a local community chest. Provan, Beyer, and Kruytbosch (1980) found that the United Way was more generous in allocating resources to agencies that maintained joint programs with other agencies. Investigating the private sector, Assael (1969) found that dealers who belonged to dealer associations were less dependent on a manufacturer. Etgar (1976b) found that the number of companies an independent insurance agent represents is inversely related to an individual company's power. Skinner and Guiltinan (1986) found that involvement in joint programs with other dealers and ties with supplemental suppliers reduced dealers' dependence on a focal manufacturer.

In some instances, relationships with customers (Litwak & Hylton, 1962) and elites (Zald, 1970) enable one organization to become more powerful in its relationship with another. Provan and colleagues (1980) found that an agency's links with the surrounding community through interested individuals and elites were a significant predictor of power. Galaskiewicz and Shatin (1981) reported that human service organizations were more likely to cooperate if leaders had overlapping memberships. Such environmental linkages should also affect power-dependence relationships in manufacturer-dealer networks. For instance, dealers with large customer bases should have more power in their relations with a manufacturer than dealers with small customer bases. Finally, a dealer with a personal contact on the board of directors of a manufacturing organization or an industry trade association may be privy to information not readily available to all other dealers.

Previous research (Braito, Paulsen, & Klonglon, 1972; Pfeffer & Salancik, 1978) has emphasized the importance of establishment in a domain for gaining support from an environment. Organizations that have been successful for a long time have demonstrated their ability to define and maintain a domain that provides them with needed resources (Kotter, 1979; Provan et al., 1980). In a manufacturer-dealer network, dealers who have been in business longer should be in a better position to defend their domains.

Pfeffer and Salanick (1978) argued that small organizations are more likely to be dependent on their environments for resources. The relative size of an organization is also an important factor when assessing manufacturer-dealer relations (Etgar, 1977). Manufacturers are more dependent on large dealers than on small dealers to distribute their products. Additionally, large organizations, which employ more people than small firms and have greater competitive strength in sales or market share, are likely to be more powerful than small organizations (Aldrich, 1979).

The effectiveness of such environmental linkages in reducing a supplier's power may vary depending on transactional form. Through corporate ownership, a manufacturer may exercise a great deal of influence over dealers; environmental linkages may be a useful strategy to counter such influence. In a conventional arrangement, if a supplier attempts to exert extreme influence over a dealer, the dealer can generally select another supplier; therefore, in conventional networks, dealers may not commonly employ environmental linkages to reduce power because there are fewer barriers to entry and exit than in the other types of networks (Williamson, 1975). A contractual agreement, which may increase the extent a manufacturer influences dealers, may encourage dealers to develop environmental linkages.

> *Hypothesis 2: (a) The greater a dealer's ties to its environment through environmental linkages, such as joint programs, industry contacts, number of employees, number of customers, number of years in business, and market share, the less the dealer will be influenced by a manufacturer. (b) The effects of those environmental linkages and resource dependence on a manufacturer's influence will vary with transactional form.*

Respondents

Data were collected through a questionnaire from individuals in three agricultural-chemical distribution networks. The networks consisted of three different manufacturers and their dealers. One manufacturer employed a corporate network; one, a conventional network; and the third, a contractual network to distribute chemicals. In all three, the dealers acted as resellers, providing agricultural products to farmers and other resellers. We sent a questionnaire to the manager of each dealership because managers were in the best, in most cases, the only position to assess the issues of interest. All

the dealerships in all three networks employed managers with similar responsibilities, so responses were from comparable representatives.

The first transactional form studied was a corporate network, in which a manufacturer owned the dealerships. Dealers acted as retailers in the distribution process and were highly dependent on the manufacturer, selling only the manufacturer's products. Although they were employees of the organization, it was in their best interests to be profitable because of the manner in which the company's profit-sharing and incentive programs were structured. Thus, dealers were motivated to interact with their environments to reduce uncertainty and enhance performance. Of the 89 dealers in this network, 66 (74.1%) returned completed questionnaires.

The second transactional form studied was a conventional network; dealerships were autonomous organizations linked to a manufacturer through exchanges alone. The parties conducted such exchanges without ownership or contracts. The dealers were essentially customers of the manufacturer, as their only link was through exchanges. Most dealers in this network also did business with other manufacturers. Of the 139 dealers in this network, 73 (52.5%) returned completed questionnaires.

The final transactional form studied was a contractual network; dealerships were not owned by a manufacturer but were tied to the manufacturer by contracts. The dealers sold only the manufacturer's product, and dealing with other manufacturers could result in sanctions ranging from the withholding of product supplies to cancellation of a contract. Dealers in this network who did in fact obtain products from alternative manufacturers were clearly aware of the potential outcome but were willing to take such risks for price, delivery, or other concessions. This network consisted of 116 dealerships, 103 (88.7%) of whose managers returned completed questionnaires.

Measurements

The dependent variable was a measure of each manager's perception of the manufacturer's influence over the strategic decisions of the dealership. Previous research has used perceived influence as a measure of power (Provan, 1982; Reve & Stern, 1979; Skinner & Guiltinan, 1986). We developed a 20-item instrument from prestudy interviews with managers of 12 dealerships, 4 from each network.[1] The items were all highly correlated and were combined into a single scale, with reliabilities (α) ranging from .88 to .97 for the three networks. The scale appears in the Appendix.

One independent variable used to predict the variability in manufacturers' influence over the decisions of dealers was perceived dependence (Van de Ven & Ferry, 1980).[2] We developed a 20-item instrument by reviewing the

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[1] The 12 managers who participated in prestudy interviews were not systematically excluded from the actual study; they may or may not have been respondents in the data collection.

[2] To enhance validity and reliability, we developed measures of influence and dependence along the same lines as measures used in previous research. However, common method variance is a limitation of any study employing a survey to measure both the dependent and independent variables.

three manufacturers' programs for and policies on providing support to their dealers. The prestudy interviews also yielded information on support. Because these items were also highly correlated, we combined them into one scale (α = .88−.96). The scale appears in the Appendix.

Perceived dependence was measured from only the dealers' side of the relationship. We did not measure the extent to which the manufacturers depended on the dealers because representatives of all the manufacturing organizations were not available to provide data. Even if the manufacturers had been willing to cooperate, it would have required evaluating the extent of each manufacturer's dependence on many dealers—over 100 in one network.[3]

As noted previously, number of joint programs, number of customers, number of industry contacts, number of years in business, number of employees, and market share were used to explain differences in the influence of manufacturers. We obtained the number of joint programs each dealer was involved in by providing managers with examples of programs that were the most likely to reduce dependence on the manufacturer—like joint advertising, joint purchasing, and joint storage—and asking them in how many they were involved. We measured contacts with industry elites similarly, by providing respondents with examples of influential industry figures—like company executives, trade association officers, board members, and bank officers—and asking them to report the average monthly number of personal contacts they had with such individuals. We obtained data on number of customers, number of years in business, number of employees, and market share from dealers' records. We measured market share on a 4-point scale (1 = below 10%, 2 = 10−15%, 3 = 16−20%, 4 = above 20%).

Analysis

Correlational analysis and stepwise regression were used to analyze the data. The first step of the regression analysis involved regressing influence on the environmental linkages; we entered perceived dependence in the second step to determine whether dependence suppresses the effects of the linkage variables. Finally, we used F-tests to examine mean differences across groups, Z-tests to compare correlations, and the Chow test (Chow, 1960) to assess the equality of the regression equations across the three networks.

RESULTS

Table 1 presents the zero-order correlations, means, and standard deviations. Perceived dependence is related to perceived influence in all three networks. Additionally, there is no significant difference (p > .05) in the three correlations, which were .66, .68, and .69 for the corporate, conventional, and contractual networks, respectively. However, the amount of influence and dependence is not the same in each network. The average

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[3] One alternative to this measurement procedure would be to employ objective measures of dependence rather than perceived measures.

TABLE 1
Correlation Matrix for All Variables[a]

Variable	Means	Standard Deviations	1	2	3	4	5	6	7	8
1. Influence	3.99	.56	1.00							
	2.03	.85	1.00							
	3.32	.61	1.00							
2. Number of joint programs	3.01	4.59	.04	1.00						
	2.62	3.86	-.13	1.00						
	1.78	3.29	-.20*	1.00						
3. Number of industry contacts	5.20	6.09	.02	.33**	1.00					
	7.30	10.13	-.14	.14	1.00					
	4.95	4.90	.01	.15	1.00					
4. Number of employees	7.66	4.94	-.37**	.15	.17	1.00				
	17.12	21.43	-.16	.39**	-.02	1.00				
	46.98	21.91	.01	.04	-.08	1.00				
5. Number of customers	234.67	173.74	-.01	.04	.39**	.39**	1.00			
	776.47	906.05	-.10	.45**	-.00	.74**	1.00			
	2059.54	1233.23	.07	.04	-.01	.78**	1.00			
6. Number of years in business	10.49	6.49	-.29**	.12	.06	.52**	.19	1.00		
	24.05	17.61	-.01	.33**	-.03	.25*	.31**	1.00		
	46.43	9.24	-.08	.03	-.06	.22*	.17*	1.00		
7. Market share	3.23	1.16	-.04	.03	.13	.17	.18	.12	1.00	
	3.42	1.54	.17	.02	.20*	.05	.23*	-.04	1.00	
	3.29	1.29	.14	-.06	-.04	.11	.09	.15	1.00	
8. Resource dependence	3.86	.62	.66**	.12	.05	-.33**	-.05	-.11	-.12	1.00
	1.78	.53	.68**	-.11	-.11	-.15	-.10	.03	.02	1.00
	3.77	.56	.69**	-.32**	-.02	-.10	.00	.02	.23*	1.00

[a] Respective cell values are: corporate network, N = 66; conventional network, N = 73; contractual network, N = 103.
* p < .05
** p < .01

amount of influence is highest in the corporate network and lowest in the conventional network; all means are significantly different ($F = 152.20$, $p < .01$). The amount of dependence in the corporate and contractual networks is higher than the amount of dependence in the conventional network ($F = 320.68$, $p < .01$).

Table 2 summarizes the results of the stepwise regression. In the corporate network, number of years in business and market share are significantly related to influence, as is perceived dependence. Dependence explains 32 percent of the variance in the dependent variable, and number of years in business and market share explain 3 and 5 percent; all predictors combined explain about 51 percent of the variance in influence. In the conventional network, a single variable from the first step, market share, is significantly related to influence ($R^2 = .029$), but not in the hypothesized direction. Once again, dependence explains most of the variance ($R^2 = .38$); all variables combine to explain about 43 percent of the variance in the influence measure. In the contractual network, number of years in business explains 1 percent of the variance in influence, and dependence, 38 percent. The combined independent variables explain about 43 percent of the variance.

Results of the Chow test suggest the regression equations for the conventional and contractual networks are equal ($F = 1.68$, $p > .05$); there are no differences in the sets of coefficients for the two regressions. However, the regression equations for the corporate and conventional networks ($F = 2.54$, $p < .01$) and the corporate and contractual networks ($F = 2.02$, $p < .05$) are

TABLE 2
Results of Stepwise Regression

| | Transactional Forms[a] | | | | | |
| | Corporate | | Conventional | | Contractual | |
Independent Variables	β	ΔR^2	β	ΔR^2	β	ΔR^2
Step 1: Environmental linkages						
Number of joint programs	.018	.001	−.033	.024	.013	.041
Number of industry contacts	.020	.001	−.098	.018	.023	.003
Number of employees	−.035	.149	−.034	.010	.100	.001
Number of customers	.116	.015	−.008	.006	.002	.008
Number of years in business	−.264**	.029	−.018	.020	−.124*	.010
Market share	−.189**	.050	.157*	.029	−.006	.025
Step 2: Resource dependence						
Resource dependence	.613**	.325	.654**	.380	.682**	.381
Cumulative R^2	.570		.487		.468	
Adjusted R^2	.511		.427		.427	

[a] $N = 66$, 73, and 103, respectively.
* $p < .05$
** $p < .01$

significantly different. Closer inspection of the results indicates that the regression coefficients for number of years in business ($t = -2.12$, $p < .05$) and market share ($t = -2.44$, $p < .02$) differ for the corporate and conventional networks, and market share's coefficient differs ($t = -2.01$, $p < .05$) for the corporate and contractual networks.[4]

DISCUSSION

The results of this study suggest that perceived power is a function of perceived dependence, regardless of transactional form. Relationships between power and dependence, however, were inconsistent across types of networks, which supports the first hypothesis. Corporate ownership and contractual agreements resulted in the maximum amount of influence, and the more autonomous conventional arrangement resulted in the least. Dependence was also lowest in the conventional network. These findings underscore the importance of examining the transactional form of an exchange relationship in the conduct of interorganizational studies. Although there is a strong power-dependence relationship in all three networks, the *amount* of power and dependence is less in the conventional network.

The results do not provide much support for Hypothesis 2a. With a few exceptions, environmental linkages explain little variance in influence when dependence is included in the regression equation. In the corporate network, number of years in business explains about 3 percent of the variance in the dependent measure, and market share explains about 5 percent of the variance. In the conventional network, market share explains about 3 percent of the variance in the influence measure, but the relationship is not in the hypothesized direction, suggesting that largeness could increase dealers' dependence on a manufacturer; for instance, higher volume could mean more disruption if products are late or unavailable. Number of years in business is a significant predictor of influence in the contractual network.

The results partially confirm Hypothesis 2b. The regression models for the corporate and conventional networks are different. Number of years in business has a greater negative effect on a manufacturer's influence in a corporate network than in a conventional network. Additionally, although market share is associated with low manufacturer's influence in the corporate network, it is associated with high manufacturer's influence in the conventional network. The regression equations for the corporate and contractual networks were also different. Market share has a greater negative effect on manufacturer's influence in the corporate network than in the contractual network. Contrary to Hypothesis 2b, there is no difference in the regression equations for the conventional and contractual networks.

In summary, the variance explained in the three networks ranges from 43 to 51 percent, which compares very favorably with results reported for previous research (Provan et al., 1980; Skinner & Guiltinan, 1985). However,

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[4] The t-statistics were calculated using unstandardized beta coefficients and associated error terms.

perceived dependence accounts for most of the explained variance. The weak results pertaining to the environmental linkages and the strong results regarding dependence should be interpreted with caution because the measurement of those variables could have been inadequate. Simply counting numbers of joint programs or industry contacts does not adequately reflect the extent of participation and involvement. Likewise, a measure of dependence based solely on dealers' perceptions may overstate the relationship between dependence and influence.

Future research should attempt to improve measures of the constructs addressed in this study. First, objective measures should be developed. Relying on dealers' reports to measure involvement in joint programs may be inaccurate. Also, objective measures of dependence, such as actual resource flows, may better capture the construct. Second, measuring dependence from both sides of a manufacturer-dealer dyad would provide a more accurate assessment of that construct. For instance, calculating the percentage of a manufacturer's product supplied to a dealer as well as the percentage of a dealer's product supplied by a manufacturer would be a more valid approach to measuring resource dependence. Making such a measure would, however, require access to information often considered confidential.

This study built upon previous research on the effects of environmental linkages on power-dependence relations. Although results do not support the hypothesized effects of environmental linkages in the settings examined, they do indicate that the amount of power and dependence varies across transactional forms in three for-profit networks.

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APPENDIX

Perceived influence scale. Managers were asked: "Please circle the number that best describes the extent to which you feel the manufacturer influences your decisions for each issue" (1 = no extent, 2 = little extent, 3 = some extent, 4 = much extent, 5 = great extent). The issues included were: pricing, credit policy, employee compensation, inventory levels, merchandising programs, sales administration, distribution programs, advertising expenditures, budgets, loan arrangements, employee training, membership in organizations, product line, employee selection, timing of product purchase, size of product purchase, sources of product supply, facility and equipment identification, manager training, and fixed asset expenditures.

Perceived dependence scale. Managers were asked: "Please circle the number that best describes the extent to which you feel you rely upon the manufacturer for each of the services listed" (1 = no extent, 2 = little extent, 3 = some extent, 4 = much extent, 5 = great extent). The services listed were: product delivery, product supply, product information, price information, employee recruiting, employee training, business acquisition assistance, legal assistance, policy recommendations, financial planning, field staff assistance, sales training, advertising, trademark identification, retail credit assistance, computerized accounting, distribution planning, financial assistance/loan counsel, equipment supply, and marketing/merchandising programs.

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SUPPLIER COMPETITION, UNCERTAINTY, AND MAKE-OR-BUY DECISIONS

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Organizations are frequently confronted with deciding whether to make or buy a good or service. Both prescriptive frameworks for managers (Culliton, 1942; Gambino, 1980) and economic theory (Williamson, 1975, 1981) have focused on cost factors as the most important determinants of make-or-buy decisions. In a previous study (Walker & Weber, 1984), we found that both production and transaction costs influenced make-or-buy decisions, although the hypotheses for transaction costs were only partially supported. In the present paper, by introducing new data about the decisions investigated and extending the theory of the original research, we elaborate on its findings, counter potentially confounding hypotheses, and identify more precisely the limits of its generalizability.

The make-or-buy decisions we studied were made by managers in a division of a large U.S. automobile firm for components of assemblies the division manufactured. The division regularly required all the components, which were either parts of new cars or replacement parts for old models. Therefore, the division faced the problem of managing potentially recurrent contracts with suppliers.

Furthermore, the production of typical components in this division, such as stamped parts and springs, required specialized dies that were owned by the division and, if the component was bought, installed in an outside supplier's manufacturing equipment. Regarding such sourcing relationships, Klein argued "After a firm invests in an asset with a low salvage value and a quasi-rent stream highly dependent upon some other asset, the owner of the other asset has the potential to hold up by appropriating the quasi-rent stream" (1980: 357). In our research, the dies were the assets with low salvage value, and the other assets necessary for using the dies were the machines in which they were installed. When a purchasing firm owns such equipment, no appropriation problem exists. It can arise when an outside supplier owns the equipment, the degree of competition in the supplier market is low, and some uncertainty exists (Williamson, 1975). The cost to a firm of writing and managing contracts to buy components might thereby increase. The costs of switching from one supplier to another might also be determined by operating or strategic factors external to the sourcing relation-

ship. The extent to which the decisions we examined were constrained by such factors was found to be low.[1]

TRANSACTION COSTS AND THE SOURCING RELATIONSHIP

Empirical tests and conceptual elaborations of the effect of small numbers bargaining on transaction costs have hinged on two concepts: the dedication or specialization of assets to transactions (Joskow, 1985; Kleindorfer & Knieps, 1982; Palay, 1985; Williamson, 1979) and switching costs (Monteverde & Teece, 1982). Neither circumstance is necessary for the transaction costs of market contracting to rise, however. Even when a buyer owns specialized assets and has low costs of switching suppliers, transaction costs can arise when the supplier is not constrained from behaving opportunistically by the presence of other firms competing for a buyer's business.

Under stable market conditions, a buyer and a supplier may resolve the potential appropriation problem posed by the lack of market competition from other suppliers through a contingent claims contract, which can specify the consequences associated with certain supplier and buyer behavior (Williamson, 1975: 28). However, as uncertainty rises regarding a buyer's future requirements and, correspondingly, regarding potential adjustment costs for suppliers, contracts become very difficult to write. Producing a component in-house consequently becomes more attractive. In the present study, we examined the effect on make-or-buy decisions of the interaction between competition among suppliers and uncertainty (Williamson, 1979); in contrast, in our previous paper we tested their independent effects.

The effects of two types of uncertainty on make-or-buy decisions in markets that were high or low in supplier competition were examined. We investigated uncertainty concerning either volume or technology. First, when competition among suppliers is lacking, unexpected changes in volume requirements raise contracting costs since there is no market to which a buyer can turn for relief from penalties imposed by a supplier. Second, when supplier market competition is low and retooling is required, a supplier may charge a buyer a premium for accommodating its technological changes. The absence of alternative vendors forces the buyer to increase the effort it expends in contract specification and monitoring. As transaction costs increase in either case, so does the attractiveness of producing a component in-house.

Finally, the influence of comparative production costs on make-or-buy decisions should be significant (Walker & Weber, 1984; Williamson, 1981). The magnitude of the effect should not differ, however, across supplier markets with high and low competition.

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[1] We measured the effects of make-or-buy decisions through questionnaire items on a scale of 1 = to no extent, to 5 = to a very great extent. Production and procurement managers responded that the decisions had little effect on capacity utilization for equipment ($\bar{x}$ = 2.0, s.d. = .66) or labor ($\bar{x}$ = 2.2, s.d. = .51), on vendor relations ($\bar{x}$ = 1.82, s.d. = .83), and on the diffusion of proprietary technology ($\bar{x}$ = 1.78, s.d. = .64).

DATA AND METHODS

Sixty decisions made by a formal make-or-buy committee composed of one manager each from purchasing, finance, sales, product engineering, manufacturing engineering, and quality assurance were examined. Of the roughly 20,000 parts the division used for assembly, the make-or-buy committee examined 60 for which more information was required before a decision could be made. The amount of information generated for each decision was extensive and included a fairly precise comparison of buyer's and supplier's production costs. Therefore, although the decisions on the 60 components constituted a convenience sample, we chose to analyze them because of the scope and detail of the available information.

To minimize key informant bias (Phillips, 1981), we exploited the functional differentiation of the committee. Only the managers from purchasing, sales, and product engineering had information relevant to this study. For each of the 60 components, we asked the purchasing manager the following questions concerning the level of market competition:

1. To what extent are there enough potential suppliers to ensure adequate competition for the sourcing of the component?[2]
2. To what extent is it difficult to judge the competitiveness of outside quotes on a component?
3. To what extent do leading outside suppliers of the component possess proprietary technology that gives them an advantage over other suppliers?

We asked the sales manager the following questions concerning the degree of volume uncertainty associated with each product:

1. To what extent are significant fluctuations in the daily/monthly volume requirement expected?[3]
2. To what extent are volume estimates considered to be uncertain?

Finally, we asked the product engineering manager the following questions regarding technological uncertainty:

1. How frequently are changes expected in the specifications of the component?
2. What is the probability of future technological improvements in the product?

Managers made all responses on Likert-type scales ranging from 1 to 5. Make-or-buy decisions were coded 0 = make and 1 = buy.

Comparative production costs were measured by the natural logarithm of the committee's estimate of the annual savings generated by making a component. The committee used the estimates, which were constructed to reflect internal transfer-pricing policy (Eccles, 1985), in making the decision for each component.

To test a model representing the interaction of market competition and the two types of uncertainty as a multiple-indicator structural equation model (Bagozzi & Phillips, 1982), we used LISREL (Jöreskog & Sörbom, 1982).

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[2] Stigler (1968: Chapter 4) devised this measure, which we reverse-scored.

[3] The question is similar to that used by Anderson and Schmittlein (1984).

FIGURE 1

Path Diagram for Multiple Indicator Model
Predicting Make-or-Buy Decisions
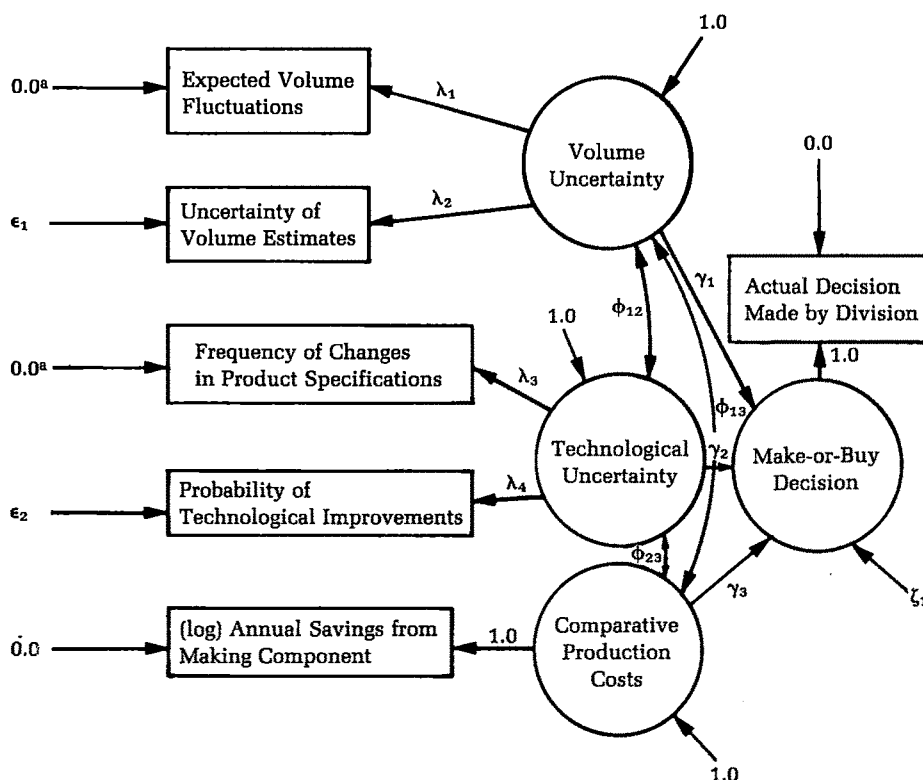
[a] Because negative estimates of error variances were produced in the initial test of the model—most likely due to the small sample size—we used Rindskopf's (1983) procedure to fix the lower bound of variances at zero.

The parameters (see Figure 1) were first estimated on the complete group of decisions. We then estimated the measurement parameters for the complete group, allowing the causal paths between make-or-buy decisions, the types of uncertainty, and comparative production costs to vary across high- and low-competition groups, which were determined by the median split of the composite variable constructed from the indicators of supplier market competition. We computed biserial correlations for the relationships between the make-or-buy variable and the other variables for both the high- and low-competition subgroups.

RESULTS

The range of correlations among the indicators of supplier market competition was .56 to .82, the average correlation was .66, and the reliability coefficient (Cronbach's alpha) for the construct was .87. Table 1 shows the intercorrelations, means, and standard deviations for the other variables. Table 2 presents the parameter estimates for the model (1) with measurement and structural equations equated across high- and low-competition subgroups and (2) with causal paths freed but measurement relationships held constant across subgroups. Analysis of the results shows that neither volume nor technological uncertainty has a significant effect on make-or-buy decisions when supplier markets are not differentiated by level of competition. This model provided a good fit to the data ($\chi^2 = 34.5$, $df = 27$, $p = .15$). The chi-square for the model in which supplier markets are differentiated according to their level of competition is 25.78 ($df = 24$, $p = .37$). The difference between the values of chi-square for the two models is 8.7 ($df = 3$, $p < .01$).

Furthermore, high uncertainty regarding volume appears to lead to a decision to make a component in low-competition markets but not in high-competition markets, as was expected. In contrast, technological uncertainty has no influence on make-or-buy decisions when supplier competition is low but leads to a buy decision when competition is high. The influence of comparative production costs on make-or-buy decisions is significant in both subgroups.

When the difference in chi-square between the two models is partitioned by the effects for production costs and the two types of uncertainty, the difference for volume uncertainty is significant ($\chi^2 = 4.7$, $p < .05$), and that for production costs is not significant ($\chi^2 = .03$, $p = .61$), both as expected. Contrary to expectation, however, the difference for technological uncertainty is not significant ($\chi^2 = 2.2$, $p = .15$).

DISCUSSION

The results suggest important distinctions between three types of imputed costs in a buyer-supplier relationship: (1) switching costs incurred by a buyer in changing suppliers; (2) adjustment costs incurred by a source, either internal or external to a buyer, in response to changes in volume or product specifications; and (3) transaction costs that buyers may experience as a result of opportunistic supplier behavior. When market competition is low, adjustment costs for suppliers caused by changes in volume requirements raise transaction costs, leading a buyer to make rather than buy (Williamson, 1979). But adjustment costs caused by changes in product specifications do not have that effect; rather, they are apparently low enough that suppliers do not increase contracting costs when competition is strong, although they are less willing to incur these adjustment costs when competition is weak.

TABLE 1
Means, Standard Deviations, and Correlations

Variables	High-Competition Subgroup		Low-Competition Subgroup		Product Moment Correlations[a]					
	Means	s.d.	Means	s.d.	1	2	3	4	5	6
1. Expected volume fluctuations	2.87	0.63	2.87	0.63	1.00	0.78	0.11	0.15	0.35	−0.60
2. Uncertain volume estimates	2.93	0.52	2.90	0.63	0.39	1.00	−0.14	−0.13	0.25	−0.39
3. Changes in specifications	2.62	1.02	2.50	1.01	−0.25	−0.32	1.00	0.95	0.04	−0.09
4. Technological improvements	2.59	1.09	2.50	1.14	−0.14	−0.24	0.92	1.00	0.04	−0.08
5. Comparative production costs	5.41	4.98	7.36	5.39	0.18	0.13	−0.22	−0.24	1.00	−0.69
6. Make-or-buy decisions	0.50	0.51	0.40	0.49	0.13	0.00	0.44	0.38	−0.65	1.00

[a] High-competition correlations appear below the diagonal; low-competition correlations are above the diagonal.

TABLE 2
LISREL Estimates for Multiple Indicator Model
Shown in Figure 1[a]

Parameters	All Decisions		Low-Competition		High-Competition	
	Parameter Estimates	Standard Errors	Parameter Estimates	Standard Errors	Parameter Estimates	Standard Errors
λ_1	.64	.15	.63	.15	.63	.15
λ_2	.34	.10	.34	.10	.34	.10
λ_3	1.01	.16	1.01	.10	1.01	.16
λ_4	1.04	.18	1.04	.18	1.04	.18
ϵ_1	.22	.07	.25	.06	.25	.06
ϵ_2	.16	.36	.16	.19	.16	.19
ϕ_{12}	−.07	.13	−.10	.13	−.10	.13
ϕ_{13}	.26	.13	.27	.13	.27	.13
ϕ_{23}	−.09	.13	−.09	.13	−.09	.13
γ_1	−.10	.06	−.21	.08	.02	.06
γ_2	.06	.05	−.10	.07	.16	.06
γ_3	−.31	.05	−.28	.07	−.30	.06
ζ_1	.13	.02	.11	.02	.11	.02

[a] For all decisions, $N = 60$; $N = 30$ for both the low- and high-competition subgroups.

The difference between the effects of the two types of uncertainty may be due to the simplicity of the context under study, in which the buyer owns the dies used in component production and pays for all retooling, and the components produced are not complex. Since switching costs are low compared to costs for producing more complex components, and the buyer shares the risk of technological change—although not the risk of changes in volume requirements—suppliers in competitive markets will not increase transaction costs when technological change occurs.

The findings of the present study are limited not only by the small amount of data but also by the strong contextual constraints that pertained. Furthermore, both the measures of technological uncertainty and the type of product studied here clearly limit the generalizability of the results.[4] For example, we focused on changes in product, not process, characteristics, which may be appropriate for the components we studied but would not be appropriate for more complex components. For the latter, a special process or especially effective use of a process might give firms a competitive advantage in their product markets.

Nevertheless, the present study suggests how organizations may either internalize the effects of uncertainty or shift those effects onto their suppliers, depending on the conditions of the contracting relationship. Future research might address modeling the development of contracting practices over time and aggregating contracting behaviors to characterize their contribution to an organization or a subunit as a whole.

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[4] For comparison, see Balakrishnan and Wernerfelt (1986), who had similar results, using a slightly different theory.

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DIVERSIFICATION AND MEASURES OF PERFORMANCE: ADDITIONAL EMPIRICAL EVIDENCE

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A question that has been in the forefront of issues relating to corporate strategy is whether firms that diversify into related lines of business outperform firms that choose conglomeration. Over the last decade, the relationship between a firm's degree of diversification and subsequent performance has been extensively researched in the literature on strategy (Bettis & Hall, 1982; Bettis & Mahajan, 1985; Christensen & Montgomery, 1981; Montgomery, 1982, 1985; Palepu, 1985; Rumelt, 1974, 1982). Rumelt developed a categorical measure of diversification in firms and analyzed the relationship between diversification strategy and performance for a sample of *Fortune* 500 firms. He found that, on average, related diversifiers outperformed unrelated diversifiers.

Later studies employing Rumelt's sample and diversification categories incorporated market characteristics, such as market share, market growth, and firm size (Christensen & Montgomery, 1981), and measures of risk (Bettis & Hall, 1982; Bettis & Mahajan, 1985) in the analysis of the relationship between diversification and performance. The findings reported in those studies indicated that the type of market in which a firm operates affects performance and that related diversification aids, but does not insure favorable performance. Montgomery (1985) found that highly diversified firms compete in less attractive markets, have lower market share, and are less profitable than less diversified firms. Wernerfelt and Montgomery (1986) reported that efficient diversifiers, which they defined as firms pursuing related types of diversification focusing on specific related skills, perform better than inefficient diversifiers when they compete in highly profitable industries. On the other hand, they found that inefficient diversifiers tend to prosper in less profitable environments. Furthermore, inefficient diversifiers were found to benefit more from markets with high growth than do efficient diversifiers.

A common characteristic of past research on diversification in the field of strategic management is the use of accounting data to measure performance. Returns on equity, assets, and sales, which are based on data from income statements and balance sheets, are the most frequently employed measures. Accounting data reflect a firm's performance over past years. Departing from this approach, Michel and Shaked (1984) employed market-based measures of risk and return developed in the discipline of finance. Such measures are

based on the price of a firm's stock, which conceptually reflects the market's perceptions of the firm's future performance. They found that firms diversifying into unrelated areas performed significantly better than related diversifiers.[1] Michel and Shaked followed Rumelt's (1974) approach of using ratios to determine the degree of relatedness between a firm's various lines of business. A recent study of diversification, industry research and development, and market performance that built on Michel and Shaked's study reported that the market rewards both unrelated diversification and an underlying involvement in research- and science-based industries (Galbraith, Samuelson, Stiles, & Merrill, 1986).

Michel and Shaked's (1984) use of market-based performance measures and the disagreement between their findings and the results reported in studies employing accounting measures of performance raise several intriguing issues. Although accounting measures of performance are historical in nature and market measures reflect the market's perceptions of future performance, we would expect results based on the two types of measures to be consistent. If a firm has performed well and is pursuing a diversification strategy that is conducive to superior performance, it should have a reasonably strong balance sheet and income statement as well as a high stock price.

Another factor that may account for the conflicting findings reported could be the differences across studies in the assignment of firms to diversification-strategy groups. Pitts and Hopkins (1982) noted that the subjective nature of Rumelt's process of measurement and categorization raises the possibility that several researchers studying the same firms might arrive at different classifications. Other studies have addressed that issue. Montgomery (1982) reported a high degree of correspondence between her classification of 128 firms into various diversification categories and Rumelt's (1974) earlier classification of the same firms; however, Nathanson (1985) found that informed executives were unable to consistently classify firms using Rumelt's classification system.

Yet another factor that may account for differences in findings is the composition of the groups of firms studied. Heavy weighting in favor of a particular type of industry or substantial differences from groups of firms investigated in other studies may affect findings. For instance, Bettis and Hall (1982) reexamined the diversification-performance linkage for Rumelt's subsamples of related-linked, related-constrained, and unrelated-diversified firms. On examining the data before performing statistical analysis, they observed that four of the six firms that performed best in terms of return on assets in the related-constrained category were major participants in the pharmaceutical industry. They therefore tested all hypotheses with and without the pharmaceutical firms. Their results suggested that much, if not most or all, of the differences in performance between related-constrained and unrelated-diversified firms in Rumelt's study were attributable to the pres-

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[1] For a discussion of the merits and shortcomings of accounting and market measures of performance, see Lubatkin and Shrieves (1986).

ence of a single industry group, the pharmaceutical firms, and not to diversification strategies per se.

Lastly, it is conceivable that differences in the time frame covered by Rumelt's (1974) study and Michel and Shaked's study could be a factor contributing to the observed results. Michel and Shaked themselves alluded to this issue by characterizing the time frame of Rumelt's study—1949 to 1969—as a stable, low inflation and low interest rate environment, and theirs—1975 to 1981—as one of considerable uncertainty, largely precipitated by the oil shock of the early seventies.

With those issues in mind, we reexamined the findings reported by Michel and Shaked, extending their work by examining the relationship between diversification strategy and performance using both an accounting measure and market measures of performance. The need for confirmation of research findings through replication and its role as an essential part of scientific methodology have been highlighted elsewhere (Dewald, Thursby, & Anderson, 1986).

METHODS

To ensure that differences in results were not due to external factors, such as subsequent merger activity, we used the same firms and the same time period (1975–81) that Michel and Shaked used. They derived their population of 51 firms from the *Fortune* 250 list of firms. Since the focus of their study was on the relationship between performance and the degree of relatedness between a firm's various lines of business, they excluded firms classified as either single-business firms or dominant-business firms. We computed relatedness ratios with data extracted from the firms' annual reports and 10-K filings, following Rumelt's (1974) guidelines. We assigned the 51 firms to low, medium, and high relatedness ratio groups along lines similar to Michel and Shaked's interval specifications. We excluded three of the firms they used—the Eaton Corporation, Grumman Corporation, and Ideal Basic Industries—from the analysis because use of Rumelt's rules for categorization led us to classify the firms as either dominant-business or single-business firms since their specialization ratios were greater than 70 percent.

The measures of economic performance based on market return that we used in this study were originally calculated by Michel and Shaked and reported in the appendix to their study (1984: 25).[2] They included Sharpe's (1966) measure, Treynor's (1965) levered and unlevered measures, and

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[2] The market-based performance measures were: Sharpe measure, $R_i - R_f / O_i$; Treynor measure, $R_i - R_f / b_i$; and Jensen measure, $R_i - [R_f + b_i(R_m - R_f)]$, where R_i = geometric average return on an individual firm's stock, R_f = geometric average return on a risk-free security, R_m = geometric average return on the market portfolio, O_i = standard deviation of the monthly rate of return on stock, and b_i = beta of stock i = cov R_i, R_m/var (R_m).

To assess whether leverage was a factor in the performance of the firms, an unlevered beta is calculated and used in Treynor's and Jensen's formulas. All of the above performance measures estimate a stock's return adjusted for risk. For a more detailed discussion, see Jacob and Petit (1984: Chapter 24).

Jensen's (1968) levered and unlevered measures, all of which incorporate a risk measure. In general, these market-return measures are based on average returns on each firm's stock above the risk-free rate of return. The excess return is then adjusted for risk by use of a firm's beta, or the standard deviation of its stock's returns. To obtain unlevered measures, the measures are further adjusted for differences in each firm's debt usage.

Returns on assets (ROA) for the seven-year period were obtained from *Standard and Poors*. We first calculated the average ROA for each firm to reduce the probability that performance data from an unusually good or bad year would confound the analysis. We then divided each firm's average ROA by its standard deviation to standardize the measure and allow for comparison across firms. A number of previous studies reported in research on strategy have used such standardized performance measures (Christensen & Montgomery, 1981; Rumelt, 1977).

RESULTS

Table 1 summarizes the matrix of correlations among the variables examined in this study. The high degree of correlation between the relatedness ratios reported by Michel and Shaked and this replication study (0.96) indicates a high level of agreement between the two studies in the classification of the firms. This high degree of interrater reliability is also consistent with Montgomery's (1982) study and lends additional support to the reliability of Rumelt's (1974) ratio measures. However, we also found some basis for the concern that the subjectivity of the classification system would result in inconsistency (Nathanson, 1985); we had to exclude three firms from our analysis because their specialization ratios were greater than 70 percent.

Table 1 also indicates that the market-performance measures as calculated by Michel and Shaked are positively correlated with each other but are negatively correlated with the accounting measure we calculated for the replication study. The finding suggests that accounting and market-based measures of performance may give conflicting results, even though they both purport to measure a firm's performance.

Table 2 presents the ranges of relatedness ratios for the diversification groups used in the analysis. Our use of alternative classification criteria—equal number of firms and equal ranges of relatedness ratios—to assign firms to diversification groups with low, medium, or high relatedness paralleled Michel and Shaked's procedure. As Table 2 shows, use of the criterion of equal number of firms entails assigning sixteen firms to each of the three diversification groups. Inevitably, this results in unequal ranges of relatedness ratios of the three groups. Similarly, when diversification groups are formed using the criterion of equal ranges of relatedness ratios, an unequal number of firms are assigned to each of the three diversification groups. We also used Rumelt's criterion to divide the firms into two groups. His criterion designates firms with a relatedness ratio less than 70 percent as unrelated diversifiers and firms with a relatedness ratio greater than 70 percent as related diversifiers.

TABLE 1
Correlations Among All Variables

Variables	1	2	3	4	5	6	7
Diversification measures							
1. Relatedness ratio, replication study							
2. Relatedness ratio, original study[a]	.96***						
Market measures of performance[b]							
3. Sharpe	.26	−.30*					
4. Treynor	.22	−.28	.98***				
5. Treynor, unlevered	.27	−.31*	.94***	.95***			
6. Jensen	.29	−.33*	.97***	.96***	.93***		
7. Jensen, unlevered	.31*	−.34*	.97***	.95***	.95***	.98***	
Accounting measure of performance[c]							
8. Standardized ROA	.05	.05	−.20	−.20	−.19	−.13	−.20

[a] Michel and Shaked (1984).

[b] Measures of a firm's average return on stock adjusted for risk. The unlevered measures are further adjusted for differences in debt usage among the firms. For further details, see Sharpe (1966), Treynor (1965), Jensen (1968), and Jacob and Petit (1984).

[c] Average ROA for 1975–81 divided by standard deviation.

  *$p < .05$

  **$p < .01$

  ***$p < .001$

TABLE 2
Classification of Firms into Diversification Groups:
Ranges of Relatedness Ratios Employed
in Replication Study and Original Study[a]

Basis of Groups and Studies	Low Relatedness		Medium Relatedness		High Relatedness	
	Range	N	Range	N	Range	N
a) Equal number of firms						
Replication	34.0–59.2	16	59.3–87.5	16	87.6–100.0	16
Original	34.0–63.5	16	63.6–87.5	16	87.6–100.0	16
b) Relatedness ratios of equal range						
Replication	34.0–56.0	13	56.1–78.0	16	78.1–100.0	19
Original	34.0–56.0	11	56.1–78.0	18	78.1–100.0	19
c) Rumelt's criterion[b]						
Replication	34.0–70.0	22			70.1–100.0	26
Original	34.0–70.0	21			70.1–100.0	27

[a] "Original study" indicates Michel and Shaked (1984).

[b] Rumelt (1974).

Pairwise comparisons of diversification groups were performed using Duncan's (1955) multiple range test. Results of the test appear in Table 3. The results for the statistical significance of performance differences between groups presented in the columns labeled "Original Study" are based on our *reanalysis* of relatedness ratio data and performance data reported by Michel and Shaked in the appendix to their study (1984: 25). The results of our reanalysis with Duncan's test differ in certain respects from the results reported by Michel and Shaked, which were based on t-tests (1984: 23). The rationale for using Duncan's multiple range test or other tests for multiple comparison of means, rather than multiple t-tests, is that the former adjust for the nonindependence of multiple t-tests (Keppel, 1973; Montgomery, 1984).

An examination of Table 3 reveals that the results of the replication study are generally consistent with the results of our reanalysis of Michel and Shaked's data. The only exceptions are for the Sharpe measure applied to equal-size diversification groups and for Treynor's measure applied to Rumelt's diversification groups; the replication study revealed no significant differences in either case. It is interesting to note that for the equal-size diversification groups, the results of our reanalysis and of the replication suggest that firms in the low-relatedness group (G_1) significantly outperform those in the high-relatedness group (G_3). Results of the other two sets of paired comparisons $(G_1$ vs. G_2 and G_2 vs. $G_3)$ are nonsignificant. On the other hand, for the case of equal-range diversification groups, the results suggest that firms in the medium-relatedness group (G_2) significantly outperform firms in the high-relatedness group (G_3). The results of the other two sets of paired comparisons $(G_1$ vs. G_2 and G_1 vs. $G_3)$ reveal that eight out of the ten paired comparisons are nonsignificant. Lastly, the results for diversification groups based on Rumelt's criterion reveal that firms with low relatedness ratios significantly outperformed those with high relatedness ratios.

Michel and Shaked's use of two cutoff points in their assignment of firms to the three relatedness groups raises an unwelcome possibility. The composition of firms in each of the three relatedness ratio groups using equal number and equal range as criteria could perhaps affect the results observed. A careful examination of the firms constituting the three relatedness groups formed when two different criteria are employed confirms this concern. Three firms that both we and Michel and Shaked studied fall in the low-relatedness group under the equal-number-of-firms rule but in the medium-relatedness group when the groups are based on equal ranges. A fourth firm common to both studies is in the medium-relatedness group under the equal-size approach but in the high-relatedness group when equal ranges are used. Hence, we excluded those four firms (FMC Corporation, Raytheon Company, Ethyl Corporation, and Ralston Purina Company) and repeated the analysis. Table 4 summarizes the mean values for each diversification group with and without the four.

Analysis of the reduced data set reveals no significant differences in performance between firms with low, medium, and high relatedness ratios; the basis underlying the formation of the groups makes no difference.

TABLE 3
Significant Performance Differences Between Groups of Firms[a]

Performance Measures	Equal-Size Diversification Groups[b]		Equal-Range Diversification Groups[b]		Diversification Groups Based on Rumelt's Criterion[c]	
	Original Study	Replication Study	Original Study	Replication Study	Original Study	Replication Study
Sharpe	$G_1 > G_3$	n.s.	$G_2 > G_3$	$G_2 > G_3$	$G_1 > G_2$	$G_1 > G_2$
Treynor	n.s.	n.s.	$G_2 > G_3$	$G_2 > G_3$	$G_1 > G_2$	n.s.
Treynor unlevered	$G_1 > G_3$	$G_1 > G_3$	$G_2 > G_3$	$G_2 > G_3$	$G_1 > G_2$	$G_1 > G_2$
Jensen	$G_1 > G_3$	$G_1 > G_3$	$G_2 > G_3$	$G_2 > G_3$	$G_1 > G_2$	$G_1 > G_2$
Jensen unlevered	$G_1 > G_3$	$G_1 > G_3$	$G_1 > G_2$ $G_2 > G_3$	$G_1 > G_2$ $G_2 > G_3$	$G_1 > G_2$	$G_1 > G_2$
Standardized ROA	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

[a] All pairwise comparisons reported are significant at $p = .05$; n.s. denotes pairwise comparisons that are not significant at $p = .05$; "original study" refers to Michel and Shaked's (1984) data reanalyzed with Duncan's multiple range test.

[b] G_1 = low relatedness, G_2 = medium relatedness, G_3 = high relatedness.

[c] G_1 = low relatedness and G_2 = high relatedness.

TABLE 4
Group Means for Firms with Low, Medium, and High Relatedness Ratios[a]

Performance Measures	Full Data Set			Reduced Data Set[b]		
	Low	Medium	High	Low	Medium	High
Equal-size diversification groups						
Sharpe	.1073	.0641	.0268	.0756	.0801	.0300
Treynor	.0075	.0046	.0022	.0049	.0058	.0024
Treynor unlevered	.0126	.0084	.0028	.0092	.0092	.0032
Jensen	.0025	−.0008	−.0040	.0002	−.0004	−.0035
Jensen unlevered	.0047	.0013	.0023	.0027	.0017	.0020
Standardized ROA	11.28	8.35	11.86	11.59	6.49	12.55
Equal-range diversification groups						
Sharpe	.0832	.1140	.0139	.0832	.0914	.0241
Treynor	.0054	.0085	.0011	.0054	.0066	.0019
Treynor unlevered	.0091	.0147	.0014	.0091	.0116	.0025
Jensen	.0006	.0028	−.0047	.0006	.0009	−.0041
Jensen unlevered	.0028	.0051	−.0030	.0028	.0033	−.0024
Standardized ROA	10.66	8.86	11.78	10.66	7.67	11.93
Diversification groups based on Rumelt's criterion						
Sharpe	.1034		.0344	.0864		.0426
Treynor	.0728		.0026	.0058		.0032
Treynor unlevered	.0122		.0043	.0098		.0052
Jensen	.0021		−.0032	.0008		−.0003
Jensen unlevered	.0044		−.0014	.0031		−.0009
Standardized ROA	10.77		10.27	10.26		10.32

[a] See Table 3 for results of tests of significant differences between group means. See Table 2 for ranges of relatedness groups.
[b] The reduced date set excludes FMC, Raytheon, Ethyl, and Ralston Purina. Analysis of the reduced data set revealed no significant differences between diversification groups.

A closer examination reveals that three of the four firms excluded from the analysis had relatedness ratios in the mid-range and fairly high performance; therefore, they had a significant effect on the results of the comparisons of groups. The finding suggests that variations in the firms included in the groups that resulted from using different guidelines for assigning firms to the groups influenced the results reported by Michel and Shaked.

Lastly, although no significant differences emerged between groups in respect to the accounting-based performance measure, ROA, the group with the highest mean ROA is the one with the highest mean relatedness ratio. That result is the reverse of results with the market-based performance measures in which the firms with low relatedness ratios, predominantly unrelated-diversified firms, outperform those with high relatedness ratios, predominantly related-diversified firms. Table 1, in which the ROA measure is negatively correlated with all five market performance measures, provides parallel evidence. In other words, although the accounting measure suggests that related diversifiers are better performers, market measures suggest that unrelated diversifiers are better performers.

DISCUSSION

Three main findings emerged from this study. Despite the somewhat subjective nature of the process of computing relatedness ratios, there is a high degree of interrater agreement between Michel and Shaked's computations and ours. That agreement lends additional empirical support to the various ratio measures proposed by Rumelt (1974) and helps build a case for use of Rumelt's categories. Although Rumelt's conceptualization and categorization process have been criticized for their subjectivity, it should be noted that the information from which researchers generally develop diversification categories—annual reports and 10-Ks—must meet guidelines specified by the Securities and Exchange Commission, which provides a degree of consistency to the measures. Moreover, while researchers have frequently employed product-count measures based on Standard Industrial Classification (SIC) codes because they are considered objective, Montgomery (1982) pointed out that the Office of Management and Budget follows no single principle in developing SIC classifications.[3]

The characteristics of four firms with fairly high performance and mid-range relatedness ratios—three in the low mid-range and one in the high mid-range—and their group assignments appear to have influenced the significant differences in performance between diversification groups reported by Michel and Shaked. Depending on the criteria employed, the firms fell in different groups. The consequent differences in results highlights the need for researchers to examine closely the composition of the groups they study for possible outliers.

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[3] See Ross (1986) and Belth (1984) for illustrations of the shortcomings, inconsistencies, imbalances, and outdatedness of information provided by the SIC system. Ross also contains illustrations of proposed changes in the SIC system.

The type of performance measure used—accounting or market based—seems to lead to conflicting inferences about the relationship between diversification strategy and a firm's performance. Since market measures reflect the market's perceptions of future earnings and accounting measures reflect a previous year's earnings and a current balance sheet, there might be some discrepancy between the measures if a firm's strategy has a lagged effect. Nevertheless, we would expect the two measures to move in the same direction if a firm's diversification strategy is enhancing performance.

The first finding is encouraging, as it provides additional empirical support for the reliability of a widely used measure. The second and third findings reflect the inconclusive and even contradictory nature of the findings reported to date on the relationship between diversification strategy and performance. In addition, the direction of causality warrants further investigation. It may be that performance affects how a firm chooses to diversify, rather than diversification affecting performance. Those are but a few of the questions that future research should address in this important area of strategy.

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APPENDIX[a]

Firms	Relatedness Ratio	Standardized ROA
Minnesota Mining and Manufacturing Company	34.0	5.5871
Textron Inc.	36.5	8.9472
Scovill Inc.	38.4	4.0988
Midland Ross Corporation	39.6	4.6962
McKesson Corporation	40.3	7.9103
Sperry Rand Corporation	47.5	9.8164
Bendix Corporation	50.0	7.5407
General Mills Inc.	51.9	20.7364
United Industries Corporation	52.7	6.8501
Rockwell International Corporation	53.4	4.0840
American Home Products Corporation	54.4	44.4224
General Electric Company	54.5	8.1619
Colt Industries Inc.	55.8	8.5189
Ethyl Corporation	57.5	17.3548
Raytheon Company	59.1	5.7832
FMC Corporation	59.2	18.8640
United Brands Company	59.3	2.1434
Johnson and Johnson Company	60.3	33.1045
Joy Manufacturing Company	66.4	5.8940
Gould Inc.	66.5	4.6235
Rexnord Inc.	67.2	4.3720
McGraw-Hill Inc.	69.0	6.2352
Consolidated Foods Corporation	70.4	6.5078
Beatrice Foods Inc.	71.0	9.7127
Westinghouse Electric Corporation	71.7	7.0389
Monsanto Company	72.0	2.9137

Firms	Relatedness Ratio	Standardized ROA
American Brands Inc.	75.4	3.3146
Big Three Industries Inc.	75.7	11.9904
Evans Products Company	76.4	1.8618
Anderson Clayton and Company	84.4	9.0962
Ralston Purina Company	87.5	9.0190
Eli Lilly and Company	87.5	15.7723
Sherwin Williams Company	89.9	1.5256
Union Camp	90.8	13.1387
Pfizer Inc.	92.0	39.6183
Emerson Electric Company	92.5	21.1126
Interco Inc.	93.4	12.2072
General Signal Corporation	94.0	7.8994
Honeywell Inc.	99.0	3.3373
Staley Continental Inc.	100.0	1.7228
Warner-Lambert Company	100.0	2.0021
Celanese Corporation	100.0	3.5698
Dow Chemical Company	100.0	3.8166
Ferro Corporation	100.0	6.3815
General Foods Corporation	100.0	7.3733
Abbott Laboratories	100.0	8.0468
Ingersoll Rand Company	100.0	14.1173
Bristol-Myers Company	100.0	43.9933

[a] The values shown were computed for this study. Values for Michel and Shaked's relatedness ratio and for the market-based measures of performance used in their study and in the present study appear in the appendix to their study (Michel & Shaked, 1984: 25).

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Volume 30, Number 4, December 1987

RESEARCH NOTES

FROM THE EDITOR

During my editorship I found that many members of our field apparently expect their journal editors to have special insights into the current status and future of research. In public forums and private discussions, people frequently asked me to give my judgments about such matters. The steady flow and repetitiveness of such requests surprised me. It seemed likely that the attention focused on editors' pronouncements reflected more than practical motives—like trying to find out what is expected so as to get published. Underlying this attention must be some strong cultural values and beliefs. Editors were clearly expected to be pronouncers and carriers of these values and beliefs. And so I began to conceive of the role of editor as that of a kind of shaman within the academic culture.

According to my dictionary, shaman are priests who use magic to divine the hidden, cure the sick, and control events. How well do editors qualify? Discerning patterns in current research activity and predicting future trends would come close to divining the hidden. Finding ways to help authors express their ideas more effectively, analyze their data more rigorously, and bring the two into a convincing juxtaposition does sometimes produce a much stronger and presumably healthier manuscript than that originally submitted. And deciding what is accepted for publication and how manuscripts should be revised to achieve acceptance does constitute considerable control over all of those events associated with publication. But here the qualifications end. Editors cannot really do magic, and so they cannot divine all things, cure all sick manuscripts, or fully control events.

As other priests participating in the important rite of publication, reviewers are expected to possess exceptional knowledge and devotion. In the three years I have been editor, I have often been amazed by how often they do. Of course, that doesn't mean that every single review was totally correct, clear, and helpful. But the overwhelming majority seemed to me to be all of those things. This is a tribute to the seriousness and skill which so many of our field bring to the reviewing process. I have great respect for those who served on my editorial board, for the many scholars who served as ad hoc reviewers (listed elsewhere in this issue), and for three truly dedicated consulting editors. They have been worthy guardians of our best values.

But like other human beings, management researchers tend to attribute unfavorable outcomes to events beyond their control—often the deficiencies of reviewers (and editors). Reviewers are especially handy targets for blame because they are anonymous; thus projections on them cannot be undermined by facts about them. Of course, by evaluating papers and advising editors, reviewers participate in decisions about what gets published. But, at *AMJ* at least, they do not wholly determine final decisions on manuscripts. Also, it is rare that a single reviewer's comments are the sole basis of an adverse decision, although a single reviewer's enthusiasm has sometimes led to publication of a paper.

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What is probably more important and often forgotten by those who complain about reviewers is that they provide feedback to authors about the quality of their research and how it might be improved. Whether or not that feedback is then used to improve the quality of research in our field depends of what authors do and don't do. So, in the end, authors control a great deal: they decide where to submit, whether to comply with feedback to achieve publication in a particular journal, and whether to use the feedback they have received in future research.

Reading their letters and talking to disappointed authors has helped me to detect several prevalent misunderstandings about the review process. The first concerns the qualifications of reviewers. Some submitters feel that only those few persons who have also published in the same topic area, narrowly defined, are qualified to pass judgment on their paper. As all editors know, those who are cited heavily in a paper are not the most objective of reviewers. Editors often choose one such reviewer and balance the overall evaluation with less involved ones. Other submitters feel that only those who have a long track record of publishing are qualified. But not all well-published scholars are willing to do reviewing; they are often too busy with other activities, including many other requests for reviews of all kinds. Some refuse; others are late in returning reviews; sometimes the reviews are prompt but obviously hastily written without a thorough reading of the paper. Like most authors, editors prefer prompt reviews with clear, thorough comments. So when they choose reviewers, editors consider their performance as reviewers as well as their publication records and areas of expertise. When it comes to the newest methodologies, relatively junior scholars are often the most expert. Again, editors balance one kind of qualification with another and do the best they can within practical constraints.

A second misunderstanding concerns the meaning of comments. Some reviewers interpret questions asked by reviewers or the editor as reflecting lack of knowledge. More likely the questions are intended to spur the author to clarify the point at issue in the paper itself.

A third concerns the actual evaluation of the paper by the reviewers. Many authors think, unless the reviewer explicitly states in the comments provided that the paper should be rejected, that the referee recommended a revision to the editor. Actually, referees will often recommend a rejection and still offer comments for revision in case the editor disagrees with them or to help the author revise for submission to another journal. Some referees write only nice comments to the author yet recommend rejection. Thus the tone and content of a referee's comments are not a sure way to detect the overall evaluation given to an editor.

To avoid such misunderstandings, authors who aspire to be regular publishers must try to reduce the inevitable emotionality and defensiveness provoked by comments on their submissions and try instead to frame them as constructive feedback and an opportunity for learning. Reading many sets of responses of our comments has convinced me that scholars vary greatly in

their abilities and willingness to do this. If a reviewer didn't understand a point, how can it be explained to make it clearer? If a reviewer detected a weakness in the study, can it still be remedied through additional data collection or data analysis? If not, what can be learned for the next study?

Of course, reviewers are not always right; sometimes they are wrong, and then the authors should civilly argue their case. When a revision is encouraged, appropriate additional evidence and arguments to buttress and clarify specific points in question will often satisfy the reviewers and editors. Decisions to reject are more difficult to challenge, but most editors consider appeals. Authors should remember, however, that decisions to reject are rarely made for a single reason. The editor, in particular, is looking at the paper in an overall sense in evaluating it. Not every deficiency is fatal, but some are, and a large number of nonfatal deficiencies often results in a negative decision in a journal as selective as *AMJ*. Thus, correcting the record on one or even a few points is often insufficient to change a negative decision.

My experiences suggest some other general observations that may be helpful to some authors: (1) Research on well-studied topics requires more rigorous methods and theory to be published than research on less-studied or new topics; the state of the art of research on a topic becomes the standard by which subsequent studies are judged. (2) What is considered adequate in terms of methodology changes continually; what was acceptable three or four years ago therefore may not be acceptable today; if it does not lead the field, research should be modeled after the very latest publications and conference presentations. (3) Current standards favor more than one source of data (common method variance is a big concern), repeated data collections (more than one time period or repeated lab experiments), sophisticated statistical analysis (almost invariably multivariate), and multiple methods (e.g., qualitative and quantitative, laboratory and field research). Some loosening of these expectations occurs for papers that are in areas that are relatively under-researched or have other strong appeal.

The following table gives the status of all manuscripts submitted under my editorship as of October 5, 1987, when this issue went to press:

	1984[a]		1985		1986		1987[b]	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Accepted	35	14.2	40	8.9	36	7.5	6	2.4
Revision invited	14	5.7	30	6.7	51	10.6	40	15.9
Rejected	197	80.1	380	84.4	392	81.8	195	77.7
Under review	—	—	—	—	—	—	10	4.0
Total	246	100.0	450	100.0	479	100.0	251	100.0

[a] Submissions received July 15 – December 15
[b] Submissions received January 1 – July 14

It should be noted that these statistics are compiled relative to the actual date of submissions (rather than that of the decision); they thus accurately reflect

the actual percentages of what was eventually accepted or rejected from any given year's submissions. They do not count the many revisions received each year. Also, I accepted and published 6 manuscripts not counted above because they were originally submitted under Tom Mahoney's editorship.

Because I am still receiving and will be accepting some revisions until December 31, an update of these statistics for all papers submitted during my editorship by the fields represented will be published in the March 1988 issue. Turnaround times in 1987 were similar to those of prior years—a mean of 55 days and a median of 53 days from first submission to first decision.

One statistic in this table surprised me; this is the number of manuscripts for which revisions are still outstanding. Since our policy has been to minimize revisions, most of these cannot be cases where the authors simply grew tired after multiple revisions. I hope that most of these manuscripts were revised and have achieved publication elsewhere. I fear some may be sitting in drawers because authors were either discouraged or too busy. Achieving publication in any selective journal usually requires lots of hard work and persistence—more than many inexperienced authors expect. Because most articles are rejected on the first submission, an invitation to resubmit is relatively infrequent and meant as encouragement. Invitations to revise are therefore invitations that should usually be accepted unless the authors feel the reviewers have detected a fatal flaw. Especially when data were collected in the field, we bear a collective responsibility to see that it is used to inform the theory and practice of management.

Many of the articles that did not achieve acceptance exhibited similar weaknesses. Most frequent is a lack of fit between theory and data; authors often advance theory they cannot test adequately. Another frequent problem is the lack of any convincing theoretical grounding. Even studies that do not intend to advance theory must be placed within some body of theory to make them scientifically meaningful. Most current submissions show evidence of careful statistical design; unfortunately, only a small proportion are as careful about sampling and measurement. Too many studies, in my opinion, still rely on student samples, hypothetical situations, and paper people, or on weak measures. Finally, many studies are not well-grounded in the relevant literatures. There seems to be more emphasis than is warranted on discovering and naming a new variable or measure. Progress in our field might be swifter and steadier if larger numbers of scholars carefully used and built upon previous scholars' work.

Serving as editor of *AMJ* has been a memorable and challenging experience. I've learned a lot from so many of you and enjoyed myself besides. I feel honored I was given the opportunity and am gratified by your generally gracious responses to my efforts.

J. M. B.

MULTIDIVISIONAL STRUCTURE
AND PERFORMANCE: THE CONTINGENCY
OF DIVERSIFICATION STRATEGY

ROBERT E. HOSKISSON
Texas A&M University

This study examined the relationship between multidivisional (M-form) structure and performance. Theoretical work by Hill and Hoskisson suggested that the relationship between implementation of such a structure and performance should vary with diversification strategy. Findings based on longitudinal analysis of data from 62 firms in 20 industries indicate that M-form implementation increased the rate of return for unrelated diversifiers but decreased the rate of return of firms that adopted vertical integration. For related diversifiers, the change was not significant. Risk generally decreased after M-form restructuring, but the decrease was only significant for unrelated-diversified and vertically integrated firms.

How do large multiproduct firms manage the diversity of their operations? Chandler's (1962) important historical study of American enterprise suggested that the multidivisional (M-form) structure evolved as a response to the problems of managing growth and diversity within a centralized functional (U-form) structure. Williamson (1975), building on Chandler's work, theorized that for large multiproduct firms a multidivisional structure has information-processing advantages over a functional structure. According to this line of reasoning, multiproduct firms using a functional structure would suffer inefficiencies. Some researchers have gone even further and argued that the M-form structure is always related to better performance in large multiproduct firms (Teece, 1981).

Most previous empirical research on the issue has tended to support the proposition that M-form reorganization positively affects performance in large corporations regardless of other contingencies (Armour & Teece, 1978; Ezzamel & Hilton, 1980; Harris, 1983; Hill, 1985b; Hoskisson & Galbraith, 1985; Rumelt, 1974; Steer & Cable, 1978; Teece, 1981; Thompson, 1981). However, some recent research has provided mixed evidence. In particular, Hoskisson (1987), Buhner and Moller (1985), and Bettis and Chen (1986) produced results differing from previous empirical tests by separating performance into two components: (1) rate of return and (2) risk, or variability in

rate of return. Following this line of inquiry, in the present research I developed and tested hypotheses for performance components reflecting both risk and return.

Although it built on previous work that tested an unadjusted relationship between M-form structures and performance, this study focused on developing and testing a contingency perspective in which implementation of an M-form structure is related to performance under different strategic conditions (Hill & Hoskisson, 1987). Kay (1982) suggested that Williamson's (1975) distinction between functionally structured firms and M-form firms is too simple because all diversification strategies do not have the same economic intent. Therefore, examining the economic rationale for various diversification strategies seemed a useful starting point for developing a contingency perspective. Galbraith and Nathanson (1979) traced the evolution of the M-form structure to three major categories of corporate diversification strategy: vertical integration, related business diversification, and unrelated business diversification. Each strategy involves a different economic objective. My central proposition is that implementing an M-form structure affects performance differently depending on which strategy exists before implementation. I investigated that proposition by monitoring the performance of large multiproduct firms before and after reorganization.

THE M-FORM STRUCTURE

Williamson (1975) proposed that the M-form is a unique structural framework that overcomes problems of both internal and strategic control that confront large multiproduct firms. Williamson (1975: 134) suggested that large, diverse organizations that kept a U-form structure and did not adopt an M-form would ultimately experience a reduction in efficiency due to a loss of internal control and a loss of direction due to less strategic control. Both problems result from bounded rationality, which creates inefficiencies through strained information flows. In a diversified U-form, a chief executive officer (CEO) is confronted with too much information to process.

Williamson suggested that internal and strategic control improve upon implementation of an M-form structure. Internal control improves as the information-processing requirements of the chief executive decrease. The delegation of operating responsibilities to semiautonomous divisions reduces the need for top executives to deal with day-to-day operational issues and reduces need for coordination between business units. Introducing annual budgeting and centralized financial controls further attenuates internal control problems.

Williamson also proposed that the separation of overall strategic control from operating control in an M-form structure reduces strategic control problems. The role of a CEO becomes scanning and forecasting opportunities and threats to the whole firm and allocating resources accordingly. Strategic affairs at the product-market level are delegated to division managers who have the information pertinent to those strategic decisions.

THEORY AND HYPOTHESES

Unrelated Diversification

Most unrelated diversifiers operate with divisional structures close to Williamson's M-form. Realizing the financial advantages of a strategy of unrelated diversification requires decomposition to distinct divisions coupled with decentralization of operating responsibilities to those divisions. Implementation of an M-form reduces top executives' involvement in day-to-day operating problems through delegation. Delegation implies that divisional managers are responsible for operating profits, which provide objective evaluation criteria for top-level executives. The new structure introduces market-like resource allocation mechanisms and corporate financial controls with accompanying divisional incentives. Thus, with the information-processing requirements of a firm's chief executive reduced through delegation, that individual devotes more time to resource allocation and overall financial control. In essence, an internal capital market comes into being in which top executives seek efficiencies through allocating capital to specific divisions on the basis of comparing objective results—the return on investment—among all subunits. Because large unrelated firms do not seek synergistic relationships between divisions, increases in efficiency are not due to economies of scope.

The most successful unrelated diversifiers focus on the development and operation of internal capital markets where efficient resource allocations are made to specific divisions. Lorsch and Allen (1973) found that unrelated diversifiers that performed more poorly than others focused too much corporate-level executive effort on integrating divisional activities. Too much integrative effort appears to compromise divisional autonomy and accountability, thereby reducing the effectiveness of an internal capital market. Dundas and Richardson's (1982) work complements this perspective. They found that successful unrelated firms operated much like holding companies; they gave considerable autonomy to divisions and kept each strictly independent but were able to provide better capital reallocation than holding companies. Therefore, there is a good match between firms pursuing an unrelated diversification strategy and firms implementing an M-form structure that results in more efficient capital allocation.

> *Hypothesis 1a: Implementation of an M-form structure*
> *in unrelated-diversified firms leads to an increase in effi-*
> *ciency as measured by rate of return.*

Total firm risk—the variability of the accounting rate of return in unrelated diversifiers—will decline after implementation of an M-form structure for two reasons. First, new internal controls implemented with divisionalization affect the aggregate variability of corporate returns because division managers can smooth divisional operating income. Donaldson (1986) suggested that managers may engage in smoothing to show consistency in returns. In highly profitable years, they may hide excess returns in order to ride out bad times, to the extent that they can transfer returns forward. In years of low

profitability, they may reduce long-term expenses like R & D to achieve consistent annual returns (Hill, 1985a; Loescher, 1984). In the aggregate, such practices would reduce the variability of a corporate rate of return.

Second, risk may decrease after implementation of an M-form structure through a corporate-level effect. Corporate managers in unrelated diversifiers can employ financial portfolio theory and reduce risk by creating a portfolio of divisional businesses such that correlation among divisional returns is less than unity. Thus, overall variability of corporate returns drops whenever the correlation among divisional returns is not perfect. Results of previous research (Hoskisson, 1987) support this notion. I found that variability on four accounting measures of performance decreased significantly for highly diversified firms after divisionalization.

> Hypothesis 1b: M-form implementation in unrelated-
> diversified firms reduces total firm risk.

Vertically Integrated Firms

Firms seeking to increase economies of scale and efficiency often employ a strategy of vertical integration (Harrigan, 1985). To achieve the economic benefits of vertical integration, they establish an M-form division for each stage of a production process. Customer divisions must buy from source divisions, and source divisions must sell to customer divisions. Such a structure requires corporate coordination to manage product transfers effectively between upstream and downstream divisions. Thus, top corporate managers are concerned with internal controls designed to mitigate problems of divisional interdependence and interdivisional transfer.

Because each division is not autonomous, resource allocations based on the distinct economic contribution of each division are dysfunctional. If each division were allowed to sell its products on the open market at market prices, resource allocation based on objective financial criteria would be possible, but that approach would nullify incentives to invest in the specialized assets necessary to realize the economic benefits of integration. Empirical evidence from vertically integrated firms indicates that incentives tend to be based primarily on overall company performance (Eccles, 1985; Kerr, 1985; Lorsch & Allen, 1973). Thus, resource allocation based on objective financial performance criteria and implementation of an internal capital market, as in an unrelated-diversified firm, would not bring increased efficiency in a vertically integrated M-form firm.

Research directly addressing the relationship between the M-form structure and performance in vertically integrated firms is mixed. The foundational work of Armour and Teece (1978), which used data from 27 petroleum industry firms, indicated some statistical support for the proposition that an M-form produces better returns than other organizational forms. They found that 15 of the firms moving to an M-form in 1955–68 outperformed firms with a functional structure by about two percentage points on return on equity. But superior performance with an M-form structure did not persist in 1969–73.

In fact, the regression parameter had a negative, though nonsignificant, sign for firms that moved to an M-form in the second period.

Bettis and Chen (1986) sought to replicate Armour and Teece's work, using stock market measures of risk-adjusted return derived from the capital asset pricing model. Contrary to the research of Armour and Teece, they concluded that an M-form structure can lower risk and might result in decreased risk-adjusted returns. They explained that their results might have differed from those of Armour and Teece because (1) they used a different measure of return, or (2) the vertically integrated firms they studied might not have experienced positive returns through M-form adoption. Overall, however, the research evidence is not conclusive.

> *Hypothesis 2a: Implementation of an M-form structure in vertically integrated firms leads to no increase in efficiency as measured by rate of return.*

Implementation of an M-form structure in a vertically integrated firm may lower risk but for a different reason than applies to unrelated diversifiers. Vertical integration requires top-level operational control. Although imposing such centralized operational controls violates the principle of divisional autonomy basic to an M-form framework, it may provide an advantage in overall strategic control. That advantage is not related to financial portfolio effects but to improved understanding of operations.

Such strategic control reduces variability through corporate smoothing of returns. Because vertical integration is implemented through the top managers of a firm, formulation of investment opportunities occurs at the top of such an organization. Investment opportunities usually affect a whole corporation rather than one division. According to Hertz (1979), Kudla (1981), and Naylor and Schauland (1976), forecasting and strategic planning are tools for coping with problems of risk and economic uncertainty. Although top managers are still involved in operations, the creation of the general office in an M-form gives them more time than they have under a U-form structure. Research by Ackerman (1970) supports this view. Comparing vertically integrated and unrelated-diversified M-form firms, he found that influence in the investment process was more concentrated at the corporate level than at the divisional level in the first. Thus, to the extent that top managers forecast the financial uncertainty of alternative investment opportunities more accurately, implementation of an M-form structure in a vertically integrated firm should reduce variability in rate of return.

Several studies have indicated such reduced risk. In my previous study (Hoskisson, 1987), M-form structures reduced risk for accounting returns. Bettis and Chen, using stock market data, found that "the M-form structure can lower market risk (i.e., systematic risk)" (1986: 21). Because the divisional incentive system associated with unrelated diversifiers is not appropriate, corporate strategic control, rather than divisional controls, reduces risk.

> *Hypothesis 2b: Implementation of an M-form structure in vertically integrated firms reduces total firm risk.*

Related Diversification

Diversified firms seeking to exploit economies of scope (Teece, 1982), or the sharing of resources and capabilities among a related set of businesses, practice related diversification. Realizing economies of scope requires interdivisional coordination among divisions. However, typical M-form incentive systems only weigh divisional performance and fail to value contributions to a sister division. As Porter suggested, "Interrelationships almost inevitably introduce some subjectivity into performance measurement ... because business unit contributions to the firm as a whole are often hard to quantify precisely" (1985: 392). If objective financial incentives are overlaid on a system seeking to pursue economies of scope, questions of equity or fairness inevitably arise. Kerr (1985) suggested that firms with such systems do not use strictly objective criteria for financial evaluation but a combination of objective and subjective criteria. Thus, as in vertically integrated firms, resource allocation based on objective financial performance criteria is compromised.

If a related diversifier is large enough, it can seek the centralized information flows necessary to achieve economies of scope through intermediate group or strategic business unit (SBU) structures. With SBU structures in place, a firm can use an internal capital market to achieve certain efficiencies. But the intermediate structures produce other problems. Bettis and Hall (1983) found that the size of a related diversifier's portfolio is restricted relative to an unrelated diversifier's and that portfolio perceptions at an intermediate group level are often at variance with perceptions at the corporate level. On the whole, related diversifiers should have somewhat better allocative efficiencies upon implementing an M-form than vertically integrated firms, but the difference should be modest. Objective financial performance criteria are still difficult to implement, and their portfolios of businesses are narrow.

Several empirical tests relate to this proposition. Buhner and Moller (1985) used a sample of German firms for which related diversification was typical. Using stock market data, they found that reorganization to a multidivisional structure related positively to a risk-adjusted measure of return. However, Rumelt (1974) found no performance differences between related-diversified firms organized functionally and related firms organized into product divisions. Further research appears to be justified.

> *Hypothesis 3a: Implementation of an M-form structure*
> *in related-diversified firms leads to a moderate increase*
> *in efficiency as measured by rate of return.*

Risk, or variability of return, should decrease in related-diversified firms adopting an M-form structure. The rationale is similar to that offered for vertically integrated firms. Because divisional interdependence limits the operation of a pure M-form incentive system, better strategic control is the basis of reduced risk.

In a related diversifier, corporate managers must have operating knowledge to assure that synergy is pursued. Synergy does not develop among

decentralized operating divisions unless a corporate-level process finds opportunities for cooperation between potentially interrelated divisions. Such a process requires centralized information flows so that corporate managers can identify opportunities for the synergistic extension of ideas developed in one division that may have applications in other divisions. Even if interdivisional task forces are employed, corporate or SBU-level executives must monitor the process to allocate resources appropriately. Thus, either at the corporate or the group level, top managers must understand operational and strategic issues to achieve economies of scope.

As was indicated, a related diversifier's portfolio of businesses should be narrower than an unrelated diversifier's. With narrow portfolios and good business-level understanding among corporate managers, related diversifiers should achieve better strategic control than unrelated diversifiers. With better strategic control, better forecasting should reduce risk. In addition, to the extent that a related diversifier can maintain a portfolio of businesses— even though it is narrow—it can reduce the variability of its corporate returns. In a test of the effect of M-form implementation, Buhner and Moller (1985) concluded that systematic risk declined significantly in a sample of related-diversified German firms.

> *Hypothesis 3b: Implementation of an M-form structure*
> *in related-diversified firms reduces total firm risk.*

METHODS

This study employed a longitudinal design because structural implementation and the relationship between strategy, structure, and performance occur over time.

Selection of Firms and Measurements

The 62 firms studied were identified as having undergone the transition to an M-form through previous published research (Armour & Teece, 1978; Harris, 1983; Teece, 1981) and through independent historical research. I classified the firms into three major strategic types, using Rumelt's (1974) methodology. There were 24 vertically integrated, 22 related-diversified, and 16 unrelated-diversified firms.[1] Table 1 lists the firms' names and the years before and after the M-form transition that are included in the analyses. I cross-checked the historical evidence on the firms to ensure the accuracy of the transition year. Where discrepancies existed between earlier studies, I reviewed the histories of the firms in question through books, corporate reports, reports in business and trade magazines, Moody's *Industrials*, and, in some cases, interviews with company archivists. To measure the effect of the change to an M-form structure, I analyzed performance before and after the change while controlling for two categorical variables and four covariates.

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[1] The firms fit the following types in Rumelt's categorization: primarily dominant vertical, related constrained, and unrelated acquisitive.

TABLE 1
Companies and Years Studied

Companies	Before M-Form Implementation	After M-Form Implementation
Vertically integrated firms		
ALCOA	1958–67	1969–78
B. F. Goodrich	1943–52	1954–63
Burlington	1952–61	1963–72
City Service	1957–66	1967–77
Continental Can	1940–49	1951–60
Crown Zellerback	1958–67	1969–78
Getty Oil	1949–58	1960–69
Goodyear *	1970–75	1977–82
Hormel	1956–65	1967–76
International Paper *	1966–72	1974–80
Kaiser Aluminum	1948–57	1959–68
Kennecott Copper	1956–65	1967–76
Marathon Oil	1953–62	1964–73
Mobil Oil	1950–59	1961–70
Occidental Petroleum *	1963–71	1972–81
Phillips Petroleum *	1966–74	1976–83
Shell Oil	1951–60	1962–71
Standard Oil (California)	1945–54	1956–65
Standard Oil of Ohio	1952–61	1963–72
Standard Oil (Indiana)	1951–60	1962–71
St. Regis Paper	1953–68	1970–79
Sun Oil	1961–70	1972–81
Union Oil	1954–63	1965–74
Uniroyal	1950–59	1961–70
Related-diversified firms		
Allied Chemical *	1963–71	1973–81
Ashland Oil	1960–69	1971–80
Bendix	1955–64	1966–75
Borden	1956–67	1969–78
Burroughs	1956–65	1967–76
Celanese	1953–62	1964–73
Coca Cola	1958–67	1969–78
CPC	1957–66	1968–77
Dow Chemical	1953–62	1964–73
General Foods	1942–51	1953–62
Heinz	1952–66	1968–77
Honeywell	1952–61	1963–72
IBM	1956–64	1966–75
Ingersoll Rand	1954–63	1965–74
Monsanto	1961–70	1972–81
Phillip Morris	1957–66	1968–77
Proctor & Gamble	1956–65	1967–76
Quaker Oats	1961–70	1972–81
Ralston Purina	1958–67	1969–78
R. J. Reynolds	1960–69	1971–80
J. P. Stevens *	1962–70	1972–80
White Motor	1959–68	1970–79

TABLE 1 (continued)

Companies	Before M-Form Implementation	After M-Form Implementation
Unrelated-diversified firms		
AMF *	1950–57	1959–66
Borg Warner	1960–69	1971–80
Brunswick	1959–68	1970–79
Colt Industries	1958–67	1969–78
Dart Industries	1952–61	1963–72
DAYCO	1956–65	1967–76
Esmark	1960–69	1971–80
FMC	1951–60	1962–71
Gulf & Western	1957–66	1968–77
ITT	1958–67	1969–78
Lear Siegler *	1955–61	1963–69
Ogden	1959–68	1970–79
Textron	1950–59	1961–70
U.S. Industries	1959–68	1970–79
Raytheon	1949–58	1960–69
SCM	1952–61	1963–72

* Indicates less than 10 years of data used.

Performance Measures

The central performance measure used in this study was a time series of return on assets (ROA) over 21 years, including the 10 years before and the 10 years after the year of reorganization. All series excluded the year of the reorganization to avoid confounding the performance measures with outcomes during the transition. For firms for which data were not available for the full 21 years, I obtained data for the same number of years before and after the change (Table 1 notes these exceptions). For the purposes of this analysis, I pooled the performance data by diversification-strategy types.

The ROA measure was chosen because of its use in previous research (e.g., Bettis & Hall, 1982); using it should facilitate comparisons among studies. I did not choose return on equity because of the likelihood of problematic changes in equity over the length of the time series. I considered financial market event analysis (e.g., Brown & Warner, 1980) but did not use that methodology because information regarding specific announcement dates of M-form reorganizations was lacking.

The measure of risk was variance in the ROA time series, or the standard deviation, in the 10 years before and the 10 years after implementation. As used in this study, accounting-determined risk measures are indicators of total firm risk. Previous research using stock market data has shown such measures to be associated with total risk, or systematic risk plus diversifiable risk (Beaver, Kettler, & Scholes, 1970). Accounting-determined risk is to a large degree directly under the control of managers, and measures of the construct are the most commonly used measures of risk in strategic management studies (Bettis & Hall, 1982; Rumelt, 1974).

Control Variables and Covariates

Two control variables and four covariates were used to control for possible intervening effects. With the length of time covered by the data, direct industry effects on performance or via type of strategy were possible. Direct effects were most likely through vertically integrated firms. The large related- and unrelated-diversified firms, all highly diversified, represented many industries, so industry effects would tend to cancel out. However, an industry effect is also possible through diversification strategy; Montgomery (1985) found that effects of aggregate market power are possible through type of diversification strategy. But even if such industry effects occurred, this study concerned changes in firms' structures with strategy held more or less constant. Although such constancy was not entirely possible given the length of time involved, I took care to choose firms and periods in which concurrent changes in strategy type were minimal.

To control for direct industry effects, I classified all firms into two-digit Standard Industrial Classification (SIC) codes, obtaining the data through a classification provided by Standard and Poor's *Register*. Sales revenues in the year of the structural transitions were the basis for classification. Use of broad, two-digit categories allowed the capture of as much sales revenue as possible within a single code. All 62 firms were captured through 20 industrial codes. In the analyses, the codes serve as a categorical control variable.

Another influence on performance may be advantages or disadvantages resulting from early or late movement to an M-form structure within a set of competitors. Armour and Teece (1978) and Teece (1980, 1981) argued that there may be advantages in moving to an M-form before competitors, if an M-form structure is more efficient for large, diverse firms than a U-form. One recent test of this hypothesis (Mahajan, Sharma, & Bettis, 1986) found no support for it. Perhaps imitators learn from first movers' mistakes and can implement an M-form more cheaply and quickly (Mansfield, 1985). To control for innovation effects, I coded the firms studied into two groups, classifying those implementing an M-form before 1967 as early movers and the rest as late movers. The year 1967 saw a distinct change, with numerous firms reorganizing to an M-form structure in that year and in each subsequent year through the late 1960s and early 1970s.

Annual growth in assets, size, and annual percentage change in gross national product were used as covariates. Scholars consider annual asset growth, measured as an annual percentage change, a control measure for return on assets and variability of return on assets. Scherer (1980) suggested that firms may sacrifice profitability in periods of growth. Studies of industrial structure also commonly use firm growth as a proxy for industry growth. I used size as a control variable because previous work has shown it to affect performance (Hall & Weiss, 1967) and variability in performance (Fisher & Hall, 1969). The natural logarithm of year-end sales served as the measure of size. Logarithmic transformation is justified when values of one variable are highly skewed—as is often the case with size—because the extreme values can

strongly affect correlations with other variables (Kimberly, 1976). Also, the distribution that results from a log transformation more closely approximates the normality assumption underlying the methods used in this study.

Percentage change in gross national product controlled for changes in performance related to major external shifts in aggregate demand. For example, increases or decreases in aggregate demand over time that confound statistical results can affect a return measure. Armour and Teece (1978) performed separate regression analyses for 1955–68 and 1969–73 and found positive effects on returns after M-form implementation for the first period only. It could be that returns reported during the first period were exceptionally good for all firms in the economy, and the nonsignificant results for the second period were simply due to regression toward the mean. Although not all companies are sensitive to concurrent shifts in demand, preliminary analysis demonstrated that the effect of demand was strong enough in the firms studied to warrant its use as a control variable (see correlation matrices in Table 3).

A final covariate was employed to control for individual companies' trends in ROA before and after the structural change. Huck and McLean (1975) indicated that this type of covariate adjustment can be used to correct for trend in the pre- and post-change periods. The covariate is the residual from separate trend analyses done for the each company before and after implementation of an M-form structure.

Tables 2 and 3 give raw means, standard deviations, and correlations for the primary variables used in the study. Table 2 provides overall statistics, and Table 3 breaks them down by strategic type and stage of M-form implementation.

TABLE 2
Overall Means, Standard Deviations, and Correlation Coefficients [a]

Variables	Means [b] Before M-Form	After M-Form	Correlations [c] 1	2	3	4
1. Return on assets	6.43 (3.44)	6.27 (2.80)		.12	.09	.05
2. Size (log of sales)	11.72 (2.23)	12.94 (2.39)	−.01		.07	.16
3. Annual asset growth	12.87 (24.67)	12.88 (21.95)	.12	.01		.06
4. Annual % change GNP	6.39 (3.52)	8.65 (2.48)	.08	−.07	.16	

[a] N = 612 for both before and after statistics.

[b] Standard deviations appear in parentheses.

[c] Correlations in the lower half of the matrix are before M-form implementation; those in the upper half are after M-form implementation.

TABLE 3
Means, Standard Deviations, and Correlation Coefficients
of Variables by Strategic Type [a] and Stage of M-Form Implementation

Variables	Means [b]		Correlations [c]			
	Before M-Form	After M-Form	1	2	3	4
(a) Vertically Integrated Firms						
1. Return on assets	6.75	5.99		.26	.14	.05
	(3.23)	(2.32)				
2. Size (log of sales)	11.78	12.77	−.02		.11	.17
	(2.54)	(2.57)				
3. Annual asset growth	12.23	11.99	.22	.00		.06
	(24.93)	(25.42)				
4. Annual % change GNP	6.58	8.20	.04	−.09	.15	
	(4.14)	(2.66)				
(b) Related-Diversified Firms						
1. Return on assets	7.74	7.37		.10	.06	−.03
	(3.11)	(3.11)				
2. Size (log of sales)	11.67	12.87	.08		.05	.21
	(2.12)	(2.26)				
3. Annual asset growth	10.33	13.66	.11	.12		.18
	(19.06)	(14.54)				
4. Annual % change GNP	6.33	9.12	.03	−.08	.21	
	(3.10)	(2.32)				
(c) Unrelated-Diversified Firms						
1. Return on assets	4.11	5.17		−.04	.05	.06
	(3.04)	(2.46)				
2. Size (log of sales)	11.72	13.30	−.14		.04	.22
	(1.83)	(1.84)				
3. Annual asset growth	17.50	13.13	.20	−.09		−.06
	(30.22)	(24.77)				
4. Annual % change GNP	6.20	8.66	.23	−.00	.16	
	(2.97)	(2.31)				

[a] Ns = 239, 218, and 155, respectively.
[b] Standard deviations are in parentheses.
[c] Correlations in lower half of matrices are before M-form implementation.

Data Analysis

Analysis of covariance was used to test the overall relationships be-
tween (1) structure and performance, both before and after M-form imple-
mentation, (2) strategy and performance, and (3) the interaction of strategy
and structure and performance. The model's control variables are industry
returns and innovation effects, and covariates include size, asset growth,
percentage change in GNP, and firm-trend residuals. The analyses sought
first to replicate previous work for the firms used in this study. Additional
analysis of covariance tested specific hypotheses, using rate of return to
relate M-form implementation to performance. To test the risk hypotheses, I

used an F-test for the difference between two variances after controlling for the effects of size, asset growth, and percentage change in GNP. These controls were accomplished by analyzing the variance differences in residual series after the potential moderating effects were removed through multiple regression.

RESULTS

Table 4 presents overall results for ROA. The results suggest that the relationships between strategy and performance and between strategy-structure interactions and performance are statistically significant, but the relationship between structure and performance is not statistically significant. Congruent with past research, type of diversification strategy is systematically related to performance. In line with results of research by Rumelt (1974), Christensen and Montgomery (1981), and Bettis and Hall (1982), related diversifiers outperformed both vertically integrated and unrelated diversified firms (see Table 5). However, the relationship of M-form implementation to performance is not in line with the results reported in most previous cross-sectional research. An interesting result in this study is the significant interaction effect between strategic type and M-form implementation. It suggests that M-form implementation has a differential effect depending on strategy and that the separation of hypotheses by strategy type was justified. The significance levels of the categorical control variables and covariates also indicate that four are important controls.

Table 5 presents the adjusted ROA means before and after implementation and the adjusted standard deviations by strategic type. Figure 1 is a graphic presentation of the trends produced by strategic type. The statistically significant difference between the means for unrelated diversifiers confirms Hypothesis 1a. M-form controls appear to boost efficiency for unrelated diversifiers implementing an internal capital market. The results also

TABLE 4
Results of Overall Analysis of Covariance
for Return on Assets

Sources	F	p
Diversification strategy	83.49	.0001
M-form implementation (before/after)	0.60	.4397
M-form × diversification interaction	18.19	.0001
Control variables		
Industry (SIC codes)	12.23	.0001
Early/late mover	18.63	.0001
Covariates		
Size (log of sales)	0.28	.5981
Annual asset growth rate (percent)	10.69	.0011
Annual percentage change in GNP	1.15	.2841
Company trend residuals	582.85	.0001

TABLE 5
F-Tests and Adjusted Return on Asset Means and Standard Deviations by Strategy Type Before and After M-Form Implementation

Measures	Before M-Form	After M-Form	*F*	*p*
Unrelated-diversified firms				
Adjusted ROA means	4.11	5.16	19.22	.0001
Adjusted standard deviations	2.90	2.42	1.43	.0283
Vertically integrated firms				
Adjusted ROA means	6.85	5.86	20.71	.0001
Adjusted standard deviations	3.23	2.23	2.10	.0001
Related-diversified firms				
Adjusted ROA means	7.60	7.11	2.39	.1228
Adjusted standard deviations	3.10	3.07	1.01	.9222

strongly support Hypothesis 1b, showing that risk, or variability of rate of return, declines after implementation of an M-form structure in unrelated-diversified firms.

The results for vertically integrated firms, indicating a significant downward shift in rate of return and risk, fail to support Hypothesis 2a but do support Hypothesis 2b. Figure 1 suggests a parallel trend in risk and return, indicating that implementing an M-form structure in a vertically integrated firm is not likely to change risk-adjusted return.

The results for related-diversified firms are similar to those for vertically integrated firms. However, the shift in returns is not significant, which confirms Hypothesis 3a. Hypothesis 3b was not supported because risk, or variability, was unchanged after M-form implementation. The results indicate risk-adjusted return for related diversifiers may be lower after M-form implementation.

DISCUSSION

The central proposition of this study was that implementation of a multidivisional structure creates varying performance levels in firms that employ the different strategic approaches of unrelated diversification, vertical integration, and related diversification. In general, findings supported such a contingency view of the relationship between performance and implementation of an M-form structure.

Hypothesis 1a was confirmed, suggesting that implementation of M-form controls tends to improve returns on investment for unrelated-diversified firms. Unrelated diversifiers appear to be in a strong position to take advantage of the allocative efficiencies inherent in the M-form framework. Not only did the unrelated-diversified firms studied improve on measures of return, they also reduced their risk (Hypothesis 1b). Therefore, this study

FIGURE 1
M-Form Implementation and Performance
by Diversification Strategy Type

	=	ROA
	=	Risk, or standard deviation of ROA
×	=	unrelated diversifiers
O	=	vertical integrators
□	=	related diversifiers
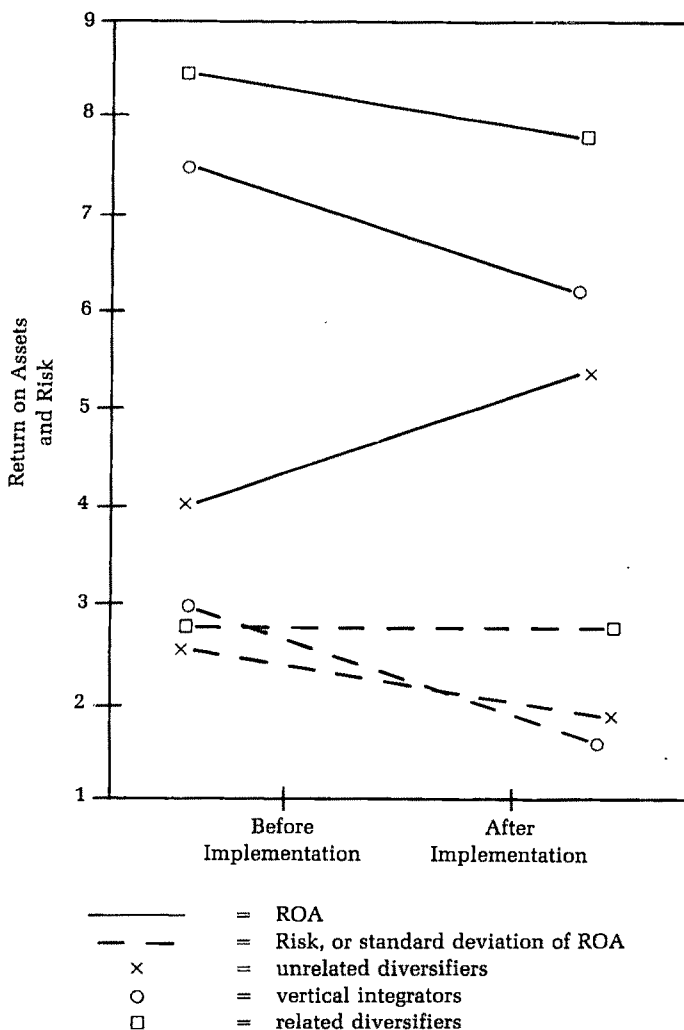
parallels the work of Bowman (1980) and of Bettis and Mahajan (1985) in supporting the idea that some firms can simultaneously reduce their risk and increase their return.

   For vertically integrated firms, Hypothesis 2a, testing the relationship of M-form implementation to return, was not confirmed, but Hypothesis 2b, testing the relationship to risk, was confirmed. Vertically integrated firms actually demonstrated decreasing rates of return after M-form implementation. One explanation for the decline in performance is that divisional interdependence compromises vertically integrated firms' ability to allocate re-

sources. Further analysis may reveal that the risk-adjusted returns were unchanged. The pooling approach used in this study made it impossible to test for such change.

For related-diversified firms, Hypothesis 3a was confirmed but Hypothesis 3b was not. Like the vertically integrated firms, related diversifiers demonstrated decrease in performance, although it was not significant. Divisional interdependence is again a possible explanation. Across the whole time period, related diversifiers outperformed the other two strategy types. What this may mean for related diversifiers is that they are at least better off than other large firms that have diversified operations, so slight decreases in performance may not be threatening. They still have above-average returns. If other related-diversified firms that have implemented an M-form structure are experiencing the same phenomenon, there should be no cause for concern.

Hill (1985a) offers an alternative explanation of these results. An M-form structure may produce short-run business efficiency, but it may not induce managers to pursue neoclassical economic efficiency and long-run economic profits, as Williamson (1975) hypothesized. From an economic point of view, an M-form may provide only average or normal economic returns in the long run. Firms producing below a normal return—in this research, unrelated diversifiers—could improve their performance by implementing an M-form. But firms with above-normal profits—in this case, related diversifiers—could actually limit their returns to normal profits in the long run by implementing an M-form framework. There may be a more efficient structure for related-diversified firms than an M-form.

Although this is an ad hoc explanation for the outcome in this study, it is quite plausible. Research in finance has shown that the gains of diversifying, or acquiring, firms are nonsignificant in the long run.[2] The M-form framework conceptualized by Williamson is built to manage diversified firms. After a portfolio of businesses reaches a certain size, a related-diversified firm can abandon the pursuit of economies of scope and manage its M-form framework as an internal capital market. Ultimately, such an M-form firm would produce returns similar to a mutual fund's: the returns for the portfolio of businesses would approach the normal return for all businesses in the market. The longitudinal results of this study could be interpreted to support such an observation.

Except for related diversifiers, the results generally suggest that M-form implementation increases a firm's capacity to manage variability in returns rather than increasing efficiency of the assets employed. However, another interpretation is plausible: managers of firms moving to an M-form framework may become more risk-averse (Loescher, 1984). It may be that with tighter financial controls and incentives based on divisional performance, divisional managers contract their time horizons. They may cut expenditures that are nonessential in the short run (R & D, market research, etc.) in order to show a strong profit in a given period. Also, the market for corporate

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[2] See Jensen and Ruback (1983) for a review.

control could reinforce an emphasis on the short term (Loescher, 1984) be-
cause top corporate officers must demonstrate that their enterprises are via-
ble in each period if they want to keep their positions. Otherwise, they may
suffer loss of control through a takeover. The ultimate result of such manage-
rial concerns could be a strong aversion to risky projects in the short term
and a possible loss of competitiveness in the long term (Hayes & Abernathy,
1980).

Obviously, more research is needed to verify the results of this study and
to test the questions it raised. M-form transitions are very elusive and, al-
though each transition identified here was documented historically, there is
no way of objectively confirming the intentions of managers at the time of a
transition. This caveat is a call for replication using different data and multi-
ple measures of performance. Until further research is accomplished, my
speculations about the effects of a historical shift to an M-form framework
must be interpreted very cautiously.

This research raised some very important questions about the M-form
structure that represent opportunities for future research. First, are the costs
of coordination implicit in vertically integrated and related-diversified firms
so great that an M-form framework at best provides them no advantage and at
worst depresses performance? Hill and Hoskisson (1987) suggested that those
two strategies require a great deal of information processing to realize the
economic gains that can be associated with them. Therefore, highly diversi-
fied firms could be turning by default to the output controls associated with
unrelated diversification because such controls require less information
processing. Insufficient information-processing capacity could also be forc-
ing much of the corporate restructuring that is currently under way. Firms
that have expanded through related diversification find that the amount of
information processing needed to realize economies of scope is too great.
They must either move to unrelated M-form controls or restructure by selling
a number of noncontrollable businesses. On the other hand, it may be that
the ability to process information has recently increased to the point that
related diversification has become more feasible (Porter, 1985).

Second, do M-form structures and continued diversification only relate
to average returns in the long run? If all M-form firms become highly
diversified, top-level managers may lose the ability to focus on a particular
market area. They become managers who compare relative yields on paper
without understanding the operational aspects of a business and may thus
fail to exploit particular competitive advantages. That scenario is similar to
Haspeslagh's (1982) arguments that an emphasis on portfolio techniques can
produce an overemphasis on efficiency that lowers market responsiveness.

Third, do managers become more risk-averse once an M-form structure
is in place? The results of this study generally show that performance varies
less after M-form implementation. Does a reduction in risk improve risk-
adjusted performance, or does diversification and an M-form structure pro-
vide a way of reducing top-level managers' employment risk (Amihud & Lev,

1981)? More research needs to be done addressing risk-adjusted returns resulting from M-form reorganization and the rationale behind such structural change and diversification. Because most very large firms in the domestic and world economies employ M-form structures, future research has the opportunity to address some very important questions.

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BOARDS OF DIRECTORS, TOP MANAGEMENT COMPENSATION, AND SHAREHOLDER RETURNS

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According to the corporate governance process and agency theory, boards of directors should reward executives on the basis of financial returns to shareholders. Studies of this issue have been inconclusive, however, and have frequently employed arguable measures of shareholders' returns. This study employed time-event methodology, a technique from financial economics, to examine abnormal returns, which are returns to shareholders corrected for the movement of the overall market. Results suggest that neither variation in abnormal returns nor overall market movements influences compensation to top executives. Tentative explanations and implications for the role of boards of directors in evaluating and rewarding top management are discussed.

When do the directors cut a CEO's salary? When disaster strikes, when the ground heaves, the walls buckle, and the roof caves in, when the wreckage is all around. Then the board, if it survives, sits up and takes action.
—Harold S. Geneen (1984: 29)

The issue of compensation to top management has received consistent attention over the last decade as pressures for executive accountability have increased. Instances of exorbitant overpayment have called into question the mechanisms intended to control corporate officers and the bases on which boards of directors determine their compensation. Critics have charged that despite their legal responsibility to shareholders, boards seem unable or unwilling to challenge or constrain managements (Nader, 1984; Townsend, 1984). Boards have been accused of granting automatic increases, regardless of a chief executive's performance (Geneen, 1984), and of taking advantage of their positions to enrich themselves and top managers at shareholders' expense (Muckley, 1984). Vance noted "stratospheric salaries" coupled with a "lack of any meaningful correlation between specific executive compensation and individual contribution to the good of the corporation and its stockholders" (1983: 74). Drucker (1984) warned of impending government regulation if compensation practice is not brought in line with shareholders' interests. Critics have in effect viewed the compensation decisions of boards as a surrogate test of the corporate governance process. To the extent that compensation for top management fails to correlate with corporate performance, boards appear to be forsaking their obligations to shareholders or, at the very least, they are failing to use compensation as a mechanism of control (Fama, 1980).

Although such charges seriously challenge the corporate governance process, not all observers agree that boards of directors are dominated by chief executive officers (CEOs) or that executive compensation practice does not serve shareholders' interest (Masson, 1971; Mizruchi, 1983). Considerable controversy surrounds the relationship between shareholder returns and top executives' compensation. Empirical work has been inconclusive, with some researchers reporting a strong relationship and others reporting no relationship (Murphy, 1985; Redling, 1981). Conceptual and methodological differences have further obscured results (Ciscel & Carroll, 1980).

The purpose of this study was to test a fundamental premise held by many, though by no means all, scholars in organization and economic theory—that modern corporations, acting through their boards of directors, reward top mangement for maximizing the interests of their stockholders. This study examined the relationship between executive performance and rewards in a group of *Fortune* 500 firms. We defined performance in terms of annual returns to shareholders adjusted for overall fluctuation in the stock market and employed time-event methodology, a technique from financial economics, to measure these abnormal shareholder returns.

CORPORATE PERFORMANCE AND COMPENSATION

As representatives of a corporation's shareholders, a board of directors is responsible for evaluating and rewarding executive performance (Cook, 1981; Mace, 1971). Friedman (1970), Rappaport (1981), and others have argued that the purpose of both a corporation's management and its board is to maximize the economic value of shareholder's investments. In the context of such a principal-agent relationship, variation in shareholder returns should provide a logical basis for executive compensation.

Baumol (1959) proposed an alternative explanation of compensation. He suggested that executives are paid not on the basis of profits returned to shareholders but on the basis of organizational size. Thus, executives attempt to maximize sales subject to a minimum profit constraint. A number of studies have provided empirical support for his hypothesis. McGuire, Chiu, and Elbing (1962) found compensation to be positively related to sales and unrelated to net profit, and subsequent research has confirmed their finding (Ciscel, 1974; Cosh, 1975; Meeks & Whitting, 1975).

A debate has developed between advocates of the sales maximization hypothesis and the profit maximization view. Lewellen and Huntsman (1970) studied the relationship between compensation and multiple measures of corporate performance, including sales, assets, profits, and rates of return. They concluded that profits had a strong influence on executive rewards, but sales appeared to have none. Other researchers have used stock price, an indicator of the market's evaluation of the future profit potential of a firm, as a measure of corporate performance. Masson (1971) found a positive, significant relationship between rewards and changes in rates of return and earnings per share. He concluded that a significant number of firms used shareholder return as an important determinant of compensation. Most recently,

Gomez-Mejia, Tosi, and Hinken (1987) provided data suggesting that owner-
ship may complicate the relationship between firm size, performance, and
compensation. Using both returns to shareholders and profitability as perfor-
mance measures, they found that in firms with a dominant external share-
holder, defined as an individual or organization holding at least 5 percent of
a firm's stock, performance was a significant predictor of CEOs' compensation.
In management-controlled firms, in which no shareholder held as much as 5
percent, firm size, not performance, predicted salary, bonus, and total
compensation.

Additional recent research has failed to resolve the controversy. Murphy
(1985) tested the relationship between stock price and compensation in a
longitudinal study of 73 firms. His primary analysis, which employed raw
rates of return as a performance measure, indicated a positive relationship
between various components of compensation and performance. In two sup-
plementary analyses, he substituted a risk-adjusted rate of return in which a
firm's return was compared to the average return of its risk class, a portfolio
of firms with similar betas. He also used an industry-relative performance
measure in which a firm's return was compared to the average return of its
industry. Although results showed that the different performance measures
affected components of compensation differently, Murphy found support for
the use of raw rates of return in predicting overall top management com-
pensation.

Benston (1985), however, reported finding no relationship between com-
pany performance and top management's compensation in a longitudinal
study of 29 conglomerates. He explained the lack of correlation on the basis
that top executives' personal wealth is generally heavily dependent on their
stock holdings and thus on the value of their firm's stock. An intentional
relationship between stock performance and salary and bonus is therefore
redundant and unnecessary. Benston based this argument on data showing
that in firms with very high shareholder returns (greater than 30%) or very
low returns (less than −30%), executives typically gained or lost about five
times their annual compensation in stock value. About 45 percent of the
firms he studied fell in this performance category. Annual compensation
exceeded gains or losses in stock value only in firms returning between −10
and +10 percent, and only 13 percent of the firms he studied were in this
category.

Coughlan and Schmidt (1985) offered a similar argument in their study of
249 corporations. As their primary performance measure, they used abnor-
mal returns based on comparisons between performance in current and pre-
vious measurement periods. They found a statistically significant relation-
ship between stock performance and executive compensation but were able
to explain only 5.4 percent of the variation in compensation. They argued
that the purpose of salary and bonus is to provide income security to execu-
tives rather than to reflect variation in a firm's performance. A strong rela-
tionship between compensation and performance is therefore unlikely and

unnecessary because stock awards to executives provide the connection between compensation and stock performance.

In an earlier review of the literature, Ciscel and Carroll (1980) noted the serious theoretical and methodological difficulties associated with research on these issues and attributed differences in findings to differences in the methodologies used. Their caveats remain relevant. Although recent research is methodologically more sophisticated than earlier research, it is important to note the variation in methods and findings across recent studies. Of two studies using raw returns in their primary analysis, one found a positive relationship between performance and compensation (Murphy, 1985), but the other found no relationship (Benston, 1985). Of two studies using measures of abnormal returns (Coughlan & Schmidt, 1985; Murphy, 1985), both found positive relationships; however, the two definitions of abnormal returns are based on entirely different constructs and are virtually noncomparable. In addition, all three studies erroneously measured a CEO's compensation as the sum of salary payments and bonus awards distributed in a given year. To the extent such compensation is based on performance, bonus awards at the end of year t represent a board's perception of a CEO's performance in year t. Salary payments distributed over year t, however, are based on a board's perceptions of performance in the previous year, $t-1$. Measurement of compensation that does not account for the lag in salary adjustment is unlikely to capture an accurate relationship between compensation and performance.

A related issue concerns the separation of salary and bonus data. Both Coughlan and Schmidt (1985) and Benston (1985) reported salary and bonus as a single figure. It is impossible, therefore, to adjust salary data for the time lag. In addition, any attempt to relate only one compensation variable to performance is obscured by the other. If bonus is tied to stock price, but salary is adjusted on the basis of past tradition, the performance-reward relationship is likely to be lost or obscured.

These recent studies raise important conceptual issues as well. Both sets of researchers suggested that correlation between annual compensation and stock performance is not critical because other components of a reward system tie an executive's interest to that of shareholders. They cite the value of stock holdings and the threat of termination as powerful influences on executives' behavior. The reasoning is that such incentives obviate the need for performance-based annual compensation.

Their reasoning is questionable on a number of grounds. First, Benston (1985) cited data showing that variation in a stock's price would dramatically affect the personal wealth of executives holding shares of the companies they manage. The greater the variation in price and the greater their holdings, the more their personal wealth would be affected. Thus, the more likely they would be to maximize shareholders' interests. It must be noted, however, that Benston studied only conglomerates, a class of firms known to have high variability in earnings and thus in stock price (Bettis & Hall, 1982).

In a truly representative sample of firms, it is likely that the more stable category of firms, with returns varying from −10 to +10 percent, would be far more heavily populated. Thus, for a far larger population of executives, current cash compensation—salary and bonus—would remain a significant, if not dominant, reward and a significant influence on their performance. ·

Second, a recent survey of the *Fortune* 1,000 (McComas, 1986), to which 512 CEOs responded, indicated that fully 9 percent of the CEOs owned no stock in their companies, an additional 6 percent owned stock worth less than $100,000, and an additional 17 percent owned less than $500,000. Regarding options on their companies' stock, 28 percent held none, 12 percent held less than $100,000 in options, and 21 percent held less than $500,000. In other words, 32 percent of the respondents owned stock of less value than their one-year median short-term compensation ($543,000), and 61 percent held options for less than that amount. For managers receiving remuneration of $500,000 or more per year, it is doubtful that stock ownership of less than their one-year compensation would motivate them to maximize shareholders' interests in the absence of more salient, short-term reinforcers.

Third, a substantial body of work in learning and cognitive psychology attests to the importance of consistency in administering reinforcement or rewards (Luthans & Kreitner, 1985). In the absence of consistent feedback and reinforcement, decision makers are prone to errors in causal inference, perception, and evaluation of criteria (Nisbett & Ross, 1980). Theorists concerned with reward systems have similarly argued for a need for congruence between the elements of systems. A primary goal of an effective reward system is the avoidance of mixed messages concerning expected performance and resulting payoffs (Lawler, 1977, 1981). The idea that some components of a system should convey expectations, criteria, and feedback different from other components contradicts both research and intuitive logic regarding the role of rewards in motivating human performance.

The issue is especially troubling in the case of top executives. Executives can only partially influence the reward in question, the value of stock holdings. Stock options, for example, are subject to restrictive regulations and the vicissitudes of the marketplace. Their value may be high when they are not exercisable and low when an individual is free to cash in. Even outright stock holdings can be drastically affected by events beyond a manager's control. It is unlikely that rational, self-interested executives would not be motivated to maximize more certain annual compensation because they are banking on the value of uncertain stock holdings.

Another conceptual issue concerns the magnitude of the relationships found between returns to shareholders and compensation. Both Coughlan and Schmidt (1985) and Murphy (1985) reported statistically significant relationships. The real effect of performance on compensation, however, remains questionable. Murphy described a "pronounced monotonic relationship" (1985: 26) between a CEO's salary and bonus and percentage change in shareholder returns. Examination of his table reveals that in firms returning

less than −30 percent to shareholders, the CEO's salary and bonus dropped by only 1.2 percent, an insignificant penalty for obviously poor performance. In firms returning more than +30 percent to shareholders, salary and bonus increased by only 8.7 percent—not insignificant, but hardly a dramatic reward. What is more surprising is that, on the average, each CEO's total pay, consisting of salary, bonus, deferred compensation, stock options, and fringe benefits, actually increased regardless of returns to shareholders. In firms returning less than −30 percent, total pay increased by 6.8 percent. In firms returning more than +30 percent, total pay increased by 22 percent.

The statistically significant relationship found by Coughlan and Schmidt (1985) appears equally ambiguous. They converted abnormal stock return performance into percentiles and used a regression equation to predict changes in salary and bonus for each percentile. Even at the very extremes of performance, their data suggest that the real effect of performance on compensation is questionable. For the very worst abnormal returns—those in the bottom percentile, with a cumulative abnormal return of −81 percent—the predicted change in salary and bonus was about −10 percent. That is undoubtedly a significant penalty, but hardly commensurate with the penalty imposed on shareholders. For the very best returns—those in the 99th percentile, with a cumulative return of +65.5 percent—the predicted change in salary and bonus was about +10 percent, a mild response to clearly outstanding performance. At less extreme performance levels, the relationship becomes even more tenuous. For firms in the 10th percentile, with a cumulative return of −38 percent, the predicted penalty in salary and bonus was only −4 percent. For firms in the 90th percentile, with a cumulative return of +32 percent, the predicted change in compensation was +5.5 percent.

To summarize, despite increasingly sophisticated research designs, recent studies of the relationship between executive performance and rewards have not resolved the debate. In fact, a number of methodological and conceptual issues remain problematic. First, there has been little consistency in the definition of stock performance. Benston (1985) used raw stock returns; Murphy (1985) used raw returns and returns adjusted for risk classes; Coughlan and Schmidt (1985) used returns adjusted for overall market performance. Second, none of these studies adjusted salary data to account for the one-year lag in salary payout. In addition, only Murphy measured salary and bonus data separately, thus allowing for separate analyses.

Conceptually, both Benston (1985) and Coughlan and Schmidt (1985) explained weak relationships between annual compensation and performance by arguing that such relationships are redundant because executives have extensive stock holdings. Such reasoning ignores the fact that significant proportions of executives own no or few shares of their companies' stock. It also ignores the psychological needs for consistency and congruence in the design of a reward system and the administration of rewards. Finally, contradictory and weak findings suggest that the conclusions reported in recent research may be overstated, despite their statistical significance.

METHODS

Clearly, the question of whether or not top executives are rewarded for maximizing shareholders' wealth remains unresolved. The purpose of the present research was to advance the debate by addressing the methodological and conceptual issues identified above. The study employed abnormal rather than raw rates of return as its measure of corporate performance. Rate of return is an appealing measure because it is a direct indicator of management's contribution to shareholders' wealth. Thus, it reflects management's performance in the basic agency role. In its raw form, however, rate of return can be misleading, for it can reflect the fluctuations of an entire industry or economy rather than managerial ability. Without a method of adjusting for market fluctuations, a board may reward a mediocre management in fortuitous circumstances or penalize superior managers who have minimized losses in adverse circumstances. In this study, we defined abnormal returns relative to previous measurement periods rather than to a beta-ranked portfolio or risk class.

The Time-Event Approach

The time-event method allowed us to separate returns to stockholders into two components: (1) normal returns representing the returns stockholders should receive to compensate them for the market risk (β) of the stock, and (2) abnormal returns above what shareholders would expect to receive on the basis of market risk. Abnormal returns are of substantial theoretical interest because they do not result from overall movements of the market but rather from events specific to a firm, events for which a management might reasonably be held responsible.

The efficient-markets hypothesis (cf. Fama, 1976) states that security prices reflect all available information. Therefore, unanticipated changes, such as major strategic moves or mergers, result in a change in the prices of a firm's securities. Theoretically, such a price change is an unbiased estimate of the present value of the change in future cash flows to the firm.

Given an efficient capital market, management actions that affect future cash flows will cause a change in a firm's security prices as soon as investors in the capital market anticipate a change. Thus, a security's price may change before the actual occurrence of an action if the potential occurrence becomes obvious or information is leaked to the market.

In the time-event method, the impact of an event on a firm's securities is measured by estimating the normal return to the stock in the absence of the event. The abnormal return to the stock is the difference between the actual return and the normal return. Investigators in the fields of finance and accounting have used this approach to study the effects on common stock prices of important economic events such as earnings and dividend announcements, capital structure changes, merger announcements, and listing decisions (Boness, Chen, & Jatusipitak, 1974; Dodd, 1977; Fama, Fisher, Jensen, & Roll, 1969; Masulis, 1983; Pettit, 1972; Wansley, Roenfeld, & Cooley,

1983). In the area of organization theory, the approach has been used to study the effects of executive succession (Reinganum, 1985).

The application of the time-event method to the problem of top management evaluation is straightforward. Boards typically evaluate a CEO near the end of a fiscal year. This evaluation usually covers the previous year and is the basis for a salary adjustment and a bonus. In the time-event approach, the previous year becomes the estimation or baseline period, and the current year becomes the analysis or focal period. Instead of looking at any particular event, an analyst cumulates the effects of all the events occurring during the analysis period and compares those effects to the estimation period. This procedure allows for the possibility of zero as well as positive or negative abnormal returns. Finally, statistical tests can be used to determine if the estimated abnormal returns, or the cumulative prediction errors, over an entire year are in fact different from zero. The Appendix gives a detailed description of the time-event method.

For evaluating executive performance, the time-event method has several features to recommend it. It corrects for the effects of overall market movements, or systematic risk. In a bull or a bear market, it separates the returns that are specific to a firm from those due to the overall market, which frequently constitute 80 percent of total returns. In a bull market, a firm's stock could rise substantially, although abnormal returns are negative. Alternatively, in a bear market, a firm's stock may fall substantially, although abnormal returns are positive. Hence, raw return data are likely to be a misleading indicator of a firm's performance.

Another virtue of the time-event method is that it uses publicly available information that cannot be withheld from outside directors or researchers. Finally, it is based on a theoretically appealing measure, abnormal returns to a firm's stockholders. The abnormal returns measure is in turn based on the market's evaluation of changes in the future cash flows to a firm that are attributable to firm-specific events rather than to overall market movements. It should also be noted that, theoretically at least, this measure is inherently a long-term indicator since it represents a consensus opinion among investors about all of the future cash flows to a firm.

Hypotheses

Given the normative assumption that top management should be held accountable for changes in shareholders' wealth that are under its control— even if such control is only partial—effective performance should be associated with positive abnormal returns. Moreover, we would logically expect a board to reward a CEO for positive abnormal returns and to penalize—or, at a minimum, not reward—a CEO for negative abnormal returns. Specifically, we would expect a sizeable bonus or salary increase or both in the presence of positive abnormal returns.

> *Hypothesis 1: Changes in CEOs' salaries and bonus levels will be positively associated with abnormal returns.*

However, a board of directors may be unaware of a firm's abnormal returns or may not even know the technical meaning of the term. A more realistic view is that a board is likely to look at the aggregate performance of a firm's stock, thereby mixing abnormal returns, overall market movement, and random fluctuations. Certainly, board members will know whether a stock's price is up or down.

> *Hypothesis 2: Changes in CEOs' salaries and bonus levels will be positively associated with overall market movements.*

The two hypotheses are *not* mutually exclusive. Both situations could occur to a greater or lesser extent at the same time. Furthermore, both hypotheses could be invalid. Such a result would suggest that boards do not consider stock price performance when rewarding CEOs.

Data and Models

In order to test the two hypotheses, we gathered data on CEOs' salary and bonus compensation that were relevant to two years, 1977 and 1980. Data were obtained from *Business Week's* annual surveys of executive compensation. We chose the two years because they represented recent extremes in aggregate stock market performance. In the bear market of 1977, the *Standard and Poor's* 500 stock index was down 11.5 percent, and during the bull market of 1980, the index was up by 25.8 percent. Hence, the two years provided an opportunity to test the effects of overall market performance on changes in executive compensation.

Data were gathered for the top corporate executive listed for each company in the *Business Week* surveys. Because bonuses are normally paid near the end of the year, we calculated the percentage of change in bonus compensation for 1977 versus 1976 and for 1980 versus 1979. Because changes in salary do not occur until the year after a year in which a raise is given, we calculated the percentage of change in salary compensation for 1978 versus 1977 and for 1981 versus 1980.

Long-term incentive compensation, such as stock options, was not studied for a number of practical and methodological reasons. We initially made attempts to include stock options, and serious measurement problems arose. The only accepted theoretical basis for valuing stock options is Black and Scholes's (1973) valuation formula.[1] This formula contains several parameters that must be crudely estimated and thus are subject to large errors. Furthermore, the resulting estimated value of an option changes every day, often by a substantial amount, depending on the price of a stock. Options amplify changes in stocks' prices. The dominant question in determining the value becomes the selection of the day on which the option is to be valued. Murphy (1985) solved this problem by chosing the day the option was granted, but we could find little justification for that procedure. A related question is what to do with previously granted options that are still in effect.

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[1] Such options are not traded and thus do not have a market value.

Stock options are an important component of executive compensation that should be studied. However, there appear to be no theoretically and empirically appropriate methods of evaluating them. Until such methods emerge, including options serves to obscure, rather than clarify, the relationships in question.

Second, long-term incentives like stock options are intended to align the future interest of a CEO with increases in the wealth of shareholders. They are ex ante measures. By contrast, salary and bonus changes are essentially ex post measures that reinforce appropriate results. Salary and bonus changes represent a form of operant conditioning, but stock options and similar schemes provide incentives for future results. Thus, it may be advisable to consider them separately.

Finally, as discussed earlier, regardless of the motivational effects of stock options on executive decision making, the need for consistent feedback from different aspects of a reward system remains crucial. Thus, salary and bonus should reinforce value-maximizing executive performance independent of the effect of stock options. As salary and bonus are independent reward mechanisms, their relationship to executive performance warrants individual study.

Our use of percentage changes in salary and bonus figures, instead of absolute changes, eliminated the need to include a variable for firm size in the regression equations. As Murphy (1985) noted, cross-sectional salary studies that use the absolute magnitudes of salary and bonus or of changes in salary and bonus but omit a firm-size variable suffer from a severe specification error. Such an error is likely to reverse the measured relationship between compensation and stock performance.

To estimate abnormal returns by company for the two years, 1977 and 1980, we used the time-event method and stock return data from the Center for Research on Stock Price tapes. Companies listed in the *Business Week* surveys were eliminated from the data set for a number of reasons, including a change in top management, a change in the manner of reporting salary or bonus data, failure to report salary or bonus separately, or failure to be included in the survey in both years. The final data set consisted of 78 companies, yielding 129 cases. Within this data set, there were 27 companies for which stock returns, salary, and bonus data were available for both years. These companies yielded 54 cases. For the remaining 51 companies, either salary or bonus data were not available for both years. These companies yielded 75 cases. To check for the effects of the missing data, we performed all the analyses for both the entire 129 cases and for the 54 cases in which complete data on a firm were available for both years. Since the results were not significantly different, we report only the analyses based on the total data set. Table 1 lists the firms studied. We do not believe the procedures used to select firms in any way biased the results. However, it is important to be aware of possible sources of bias. The inclusion of only two years does introduce the potential for bias due to temporal effects. Furthermore, these two years may not represent current practice. There has been a

TABLE 1
Firms in Study

Champion International	AMR	General Dynamics
Caterpillar Tractor	Allied	General Foods
Citicorp	Allis Chalmers	General Motors
Consolidated Foods	American Home Products	Goodrich, B.F.
Control Data	American Brands	Goodyear
Continental Illinois	American Broadcasting	Gulf Oil
Exxon	American Can	Heublein
Genesco	Atlantic Richfield	IBM
Gulf and Western	Banks America	Levi Strauss
ITT	Bendix	McGraw-Hill
Inland Steel	Bethlehem Steel	Merck
International Paper	Borden	Minnesota Mining and
Kimberly Clark	Bristol Myers	Manufacturing
Mead	Burroughs	Mobil
Monsanto	CBS	National Distillers and
J.P. Morgan	Chemical New York	Chemicals
New York Times	Coca Cola	Owens Illinois
Norton Simon	Commonwealth Edison	Phillips Pete
Philip Morris	Colgate Palmolive	Procter & Gamble
Seagram	Corning Glass Works	Rockwell International
Southern	Delta Air Lines	Shell Oil
Standard Oil of Indiana	DuPont	J.P. Stevens
Teledyne	Eastern Air Lines	Texaco
UAL	Firestone Tire & Rubber	Uniroyal
Union Carbide	First Chicago	United States Steel
Union Pacific	Ford	Warner Lambert
Westinghouse Electric	GTE	

great deal of discussion in the business media in recent years about the corporate governance process, and such discussion may be related to changes in that process since the late 1970s. Also, although the firms we studied represent a variety of diversification postures and service and manufacturing industries, no medium-sized or smaller firms were included.

Two basic regression models were used to examine the hypotheses. To test Hypothesis 1, we regressed the compensation variables, salary and bonus, against estimated abnormal returns, or cumulative prediction errors (CPEs).

$$SALARY = A_0 + A_1 (CPE) + \epsilon \quad, \qquad (1)$$
$$BONUS = A_0 + A_1 (CPE) + \epsilon \quad. \qquad (2)$$

In order to test for the overall effects of the market, a dummy variable (BORB) was introduced for discriminating between the bull market (1980) and the bear market (1977).

$$SALARY = A_0 + A_1 (CPE) + A_2 (BORB) + \epsilon \quad, \qquad (3)$$
$$BONUS = 1_{A_0} + A_1 (CPE) + A_2 (BORB) + \epsilon \quad, \qquad (4)$$

where $BORB = 1$ for 1977 (bear market), 0 for 1980 (bull market).

A significant value for A_1 in the four regression equations would suggest that boards do consider abnormal returns in their evaluation of CEOs' performance. A significant value for A_2 in Equations 3 or 4 would suggest that overall market movements influence boards in evaluating CEOs' performance.

Our models do not correct for the effects of industry membership for two reasons. First, many of the firms studied are highly diversified and hence participate in many industries. Second and more important, the use of the market model and abnormal returns makes the use of industry corrections unnecessary. The abnormal returns of all the firms in an industry will capture events having significant effects across that industry. In this sense, the model corrects for the effects of industry and can be used for intra-industry comparisons.

RESULTS

Table 2 gives summary statistics and intercorrelations for the data on compensation. The mean salary change was +12.2 percent, and the mean bonus change was +1.9 percent. The positive values for the two statistics are in contrast to the negative estimated abnormal return represented by the mean *CPE* of −0.9 percent.

Table 3 gives summary statistics for all firms broken down by bull and bear market years. The bull market year of 1980 was associated with mean

TABLE 2
Descriptive Statistics

Variables	Ns	Means	s.d.	1	2	3
1. Salary	103	.1218	.1851			
2. Bonus	113	.0194	.4679	.123		
3. Estimated abnormal return	129	−.0093	.2481	.107	.092	
4. Bull or bear market				−.122	.071	−.090

TABLE 3
Summary Statistics for Bull and Bear Markets

Variables	Ns	Means	Standard Deviations
Bull market—1980			
Salary	49	0.1454	0.1818
Bonus	51	−0.0170	0.5997
Estimated abnormal return	58	0.0154	0.2687
Bear market—1977			
Salary	54	0.1004	0.1873
Bonus	62	0.0493	0.3244
Estimated abnormal return	71	−0.0294	0.2300

salary and bonus changes of $+14.5$ and -1.7 percent, respectively, and the average value for CPE was $+1.5$ percent. For the bear market year of 1977, the figures for salary, bonus, and CPE were $+10.0$, $+4.9$, and -2.9 percent.

In 1977 and 1980, inflation proceeded at $+6.5$ and $+13.5$ percent, measured by the consumer price index. Thus, in each year the average salary increment was only slightly above the rate of inflation, and the bonus changes were below it. Corrected for inflation, the average salary increase was actually larger in the bear market. In sum, the figures in Tables 2 and 3 suggest weak, if any, relationships between stock prices and executive compensation.

In the process of calculating values for CPE as estimates of abnormal returns, we decided to make the calculation for all years from 1976 through 1981 in order to develop a good estimate of the incidence of truly abnormal performance as measured by equity returns. This procedure yielded 618 calculations of abnormal returns and associated statistics. Given a 10 percent level of significance, 115, or 18.6 percent, of the CPEs were found to be significant. Of this total, 58 were positive and 57 were negative. The analysis suggests that statistically significant abnormally good and bad performance occur infrequently—here, in about 18.6 percent of the firms studied—but with about equal frequency. In summary, it appears that under ordinary circumstances a company has roughly a 9 percent chance of generating significantly positive or negative abnormal returns in a given year.

Table 4 summarizes the results of the two regression models summarized as Equations 1 and 2. As the table shows, the coefficients of the CPEs are not significant, so the results fail to support Hypothesis 1.

Table 5 summarizes the results of the two regression models summarized as Equations 3 and 4. The coefficients of the CPEs and the dummy variables (BORB) for bull or bear market are also not significant; results fail to support Hypothesis 2. It is interesting that the only significant coefficients are the A_0 terms in both salary equations. Since the values of the two coefficients are roughly equal to the average inflation rate, it appears that salaries are on average adjusted for inflation. In sum, Tables 4 and 5 suggest that boards of directors do not normally consider stock market performance when evaluating CEOs' performance, or at least they do not consider stocks' performance when determining compensation changes for CEOs.

TABLE 4
Results of Regression Analysis
for Models Including Estimated Abnormal Returns

Dependent Variables	Independent Variables		R^2	F
	A_0	A_1		
Salary	.1154*	.0498	.006	.562
Bonus	.0561	.1883	.011	.905

*$p < .01$

TABLE 5
Results of Regression Analysis
for Models Including Estimated Abnormal Returns
and Effects of Overall Market

Dependent Variables	Independent Variables			R^2	F
	A_0	A_1	A_2		
Salary	.1279*	.0430	−.0243	.012	.531
Bonus	.0484	.1925	.0148	.010	.458

*$p < .01$

DISCUSSION

This study had two potential limitations. First, the range of CPEs, or estimated abnormal returns, may be too small to reveal adjustments in compensation. However, with a standard deviation of 0.2481 across the entire sample, changes in CPE greater than +3 percent or less than −3 percent would be common, and reason would suggest that they represent large changes in shareholders' wealth. Certainly, improving the performance of a portfolio of stocks by 3 percent above average would be a significant accomplishment.

A second and related limitation is that the nature of the relationship between performance and changes in salary and bonus may be discontinuous. For example, a step function may be appropriate where a positive or negative CPE threshold must be exceeded before salary and bonus are adjusted significantly. Future theoretical research could profitably try to establish ex ante, from economic and psychological theory, hypotheses regarding the exact nature of the functional relationship, if it is not linear.

The results presented in this paper strongly suggest that, in general, boards of directors do not consider performance of a firm's stock when changing CEOs' salaries and bonuses. Neither overall market movements nor abnormal returns were associated with adjustments in compensation. These findings lend support to critics of the corporate governance process and raise fundamental questions concerning the role of a board of directors as representatives of a company's stockholders. At worst, results suggest that boards ignore their responsibility to shareholders and increase compensation to CEOs regardless of a stock's performance. Although critics have voiced such charges, others have frequently viewed them as exaggerated or extreme viewpoints. The data presented here suggest that there is, in fact, an empirical basis for such charges.

Less pessimistic interpretations, however, derive from one of two broad explanations. The first calls into question the appropriateness of a stock's price as a criterion for a CEO's performance. The second questions salary and bonus as appropriate responses to executive performance, however defined.

In the first category, boards may be evaluating and rewarding executives rationally, but not on the basis of stock price. Perhaps boards view stock price as a short-term and inadequate measure of a firm's long-term health. From this perspective, the lack of a relationship between a stock's price and compensation may indicate a more sophisticated approach to executive evaluation. Corporations in the United States have been criticized for fostering a short-term orientation in their managers by rewarding quarterly or annual results and penalizing long-term investments (Rappaport, 1978; Thurow, 1981). The absence of a relationship between stock price and compensation might be interpreted positively as an indication that boards are encouraging CEOs to maintain a long-term outlook.

Although such an explanation is appealing from a strategic perspective, it does not appear plausible. First, the idea that its stock's price does not fully reflect a firm's performance runs counter to well-established theory in financial economics.[2] It also leaves boards of directors in a difficult position. They can choose to ignore market-based measures of performance but must then select other measures for which the tie to shareholder returns is tenuous. In essence, they must argue that eventually their stock's price will reflect their assessment. In addition, if stock price is not a primary determinant of CEOs' compensation because it is a short-term measure, then what criteria are boards using as a basis for executive evaluation and compensation? It is easy to argue that short-term measures are inappropriate and long-term measures preferable. It is far more difficult to identify and justify the alternative bases on which boards compensate executives. At some point, these judgments must relate to some defensible measure of performance.

A similar explanation, also contradicting accepted assumptions in financial economics, rests on the possibility that a board has access to information that is not available to the market. Under such circumstances, it is reasonable to expect a board's evaluation of performance to differ from the market's. Stock price, based on the market's incomplete estimate of future cash flows, would thus be an unreliable predictor of compensation.

Finally, boards may have no method of identifying the component of stock price that is attributable to management's actions versus that attributable to overall market movements. Since, on the average, about 80 percent of variation in stock price is due to overall market movements, boards may see little point in attempting to link CEOs' compensation to stock price.

The explanations just presented derive from the basic notion that stock price is an inappropriate or incomplete measure of executive performance. It is also possible that the lack of a clear relationship is due to the fact that compensation is not used as a reward for a stock's performance. Boards have available at least two other mechanisms to induce CEOs' compliance with shareholders' interests. First, boards can use the threat of termination. Announcements of terminations of CEOs occasionally appear in the *Wall Street*

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[2] See Copeland and Weston (1983) for a summary.

Journal (Benston, 1985; Mizruchi, 1983), and Coughlan and Schmidt (1985) found significant support for the role of termination as a control mechanism.

Mechanisms outside the board of directors may also induce CEOs' compliance. The simple discipline of the marketplace may itself be adequate (Williamson, 1963). CEOs may be concerned that poor corporate performance will damage their reputations, thereby making their services less highly valued in the marketplace. A second external incentive is the threat of a takeover (Walkling & Long, 1984). As events of recent years have shown, almost no company is too large to be immune from a takeover. Because the first action after a takeover is often the replacement of the top management team, the threat of takeover is a potent motivator to encourage the maximization of shareholders' wealth. In effect, external mechanisms substitute for the manipulation of rewards and punishments in the control process.

Finally, scholars have argued that long-term incentives, primarily stock ownership and options, work to align the interests of management and shareholders. Benston (1985) and Coughlan and Schmidt (1985) went so far as to reason that salary and bonus are insignificant influences, given the effects of changes in stock prices on the personal wealth of executives. If that is true, we could explain the findings of the present study in terms of a mechanism whereby long-term incentives provide a link between stock price and compensation.

A limitation of this study is that it did not measure the effects of executives' ownership of stock and options. Thus, we could not test the hypothesis that long-term incentives are related to shareholder returns. As was noted, the primary reason for this omission was the lack of an effective methodology for measuring the value of stock options held by executives. In addition, variation in the way companies value, distribute, and report stock awards introduces considerable confusion in attempts to collect such data.

It is not at all clear, however, that most executives own sufficient stock in their companies to insure the convergence of principal-agent interests. As indicated by the *Fortune* survey cited earlier (McComas, 1986), many executives neither own nor hold options on the stock of their firms. Many others hold less than appreciable amounts. For those managers, and perhaps others, the idea that stock awards substitute for salary and bonus in the control process does not provide an adequate explanation.

Furthermore, it is worth reiterating that the need for psychological consistency was a fundamental justification for this study. For a reward system to express inconsistent—indeed, contradictory—signals to top management seems indefensible. The idea that short-term compensation—salary and bonus— need not support shareholders' interests is psychologically naive, regardless of the value of stock held by executives.

It seems clear that no single study can resolve the debate over performance and executive compensation. Despite rigorous recent efforts, the issue remains complex and problematic. The present study attempted to advance the debate by addressing important conceptual and methodological issues. First, we measured performance as abnormal returns to shareholders.

Like Coughlan and Schmidt (1985), we believe this measure provides an accurate evaluation of CEOs' real performance. The study also provided an important test of the Coughlan and Schmidt's findings. Although they found a significant, positive relationship between abnormal returns and salary plus-bonus, the R^2 of their regression equation was only .054, suggesting that from a practical point of view abnormal returns were not an important determinant of CEOs' compensation in their sample. Our results appear to support this conclusion.

In summary, this study developed significant evidence that boards of directors do not generally consider the performance of a firm's stock when making salary and bonus changes. Possible explanations for this result derive from one of two premises: boards view changes in stock price as an inappropriate or insufficient criterion for judging management's performance, or directors do not use salary and bonus as mechanisms for controlling executives but rely on various substitute control mechanisms instead. We found neither explanation satisfying.

It is difficult not to concur with critics who claim there is no rational basis for the compensation paid to top management. Research thus far has failed to provide solid evidence to refute the charge. Perhaps what is needed are studies that look closely at the process by which boards make compensation decisions. Most research has attempted to infer the critical variables in the process by examining decision outcomes in relation to performance. As a result, we continue to guess at the inputs to the compensation decision. Given the importance of the topic and of the corporate governance process in general, it is clear that we must get closer to the process of top management compensation if we are to understand it.

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APPENDIX

The time-event methodology, pioneered by Fama and his colleagues (1969), rests on an equilibrium model of an individual firm's expected rate of return on equity. Assuming that security returns have a multivariate normal distribution, a single-factor market model consistent with the well-known capital asset pricing model (CAPM) (Sharpe, 1970) can be formulated for time-event studies as:

$$\tilde{R}_{jt} = \alpha_j + \beta_j \tilde{R}_{mt} + \tilde{e}_{jt} ,$$

where

$\tilde{R}_{jt}$ = rate of return on security or portfolio j over period t,

$\tilde{R}_{mt}$ = rate of return on a value-weighted market portfolio over period t,

β_j = $Cov(\tilde{R}_{jt}, \tilde{R}_{mt})/Var(\tilde{R}_{mt})$, the systematic risk of portfolio or security j, and

$\tilde{e}_{jt}$ = the random disturbance term of the rate of return on security or portfolio j over period t, with $E(\tilde{e}_{jt}) = 0$.

Since the disturbance term, e_{jt}, represents the deviation of the rate of return in period t from the expected return, it is useful as a measure of the abnormal return. More specifically, in applying this model to an event, the time surrounding the event is partitioned into two periods, an estimation period and an analysis period. The estimation period, which falls before the event, is used to estimate the parameters α_j and β_j as the intercept and slope, respectively, by a regression model of a firm's returns against market returns. Given these estimates of α_j and β_j, the prediction errors for each period t within the analysis period can be calculated as:

$$PE_{jt} = R_{jt} - (\hat{\alpha}_j + \hat{\beta}_j R_{mt}) ,$$

where α_j and β_j are the time-series ordinary least squares estimates from the prediction period. R_{jt} is, of course, the total return, and the term in parentheses is the estimate of the normal return.

Therefore, PE_{jt} measures the abnormal performance at a given time during an analysis period that is attributable to the event. To measure the cumulative effect of an event upon a security's abnormal returns up to a specific time T within an analysis period, the cumulative prediction error (CPE) is computed:

$$CPE_T = \sum_{k=1}^{T} PE_{jk}.$$

CPE is usually taken as a proxy for abnormal performance over an interval of an analysis period. The behavior of CPE can be analyzed either visually or statistically to derive inferences regarding the effects of an event under study upon a security's returns. A significant upward or downward drift in the value of CPE can be taken as evidence of a positive or negative effect on the excess risk-adjusted rate of return of a given security or portfolio. However, CPE will provide useful inferences only if the security risk, β, does not change significantly between the estimation and analysis periods. If there is a significant shift in a security's or a portfolio's systematic risk caused by the market intervention in question, a "moving-beta" CPE (cf. Bar-Yosef & Brown, 1977: 1071) can be used to allow for the possibility that new, significant information resulting from the market intervention might have caused a shift in the systematic risks.

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MERGER STRATEGIES
AND CAPITAL MARKET RISK

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The literature on corporate diversification suggests a relationship be-
tween the relatedness of merging firms and risk. We tested that notion
by classifying 297 large mergers into four relatedness categories and by
using three measures of risk: unsystematic, systematic, and total. The
findings show that risk reduction may be a valid rationale for mergers
but not for the reasons often cited. Specifically, all types of mergers are
associated with significant increases in unsystematic risk. Related
mergers, however, are associated with a significant decline in system-
atic and total risk. The possible contributions to the results made by
market conditions and leverage were explored.

Executives frequently justify a merger by claiming that it reduces a firm's
exposure to environmental uncertainties. The accuracy of that claim is not,
however, well documented. In fact, very little is known about the relation-
ship between corporate strategies and corporate uncertainty, or risk. Much of
what is known is borrowed from the literature of modern finance. Although
that literature can provide guidance to a securities manager trying to predict
the risk outcomes of stock acquisition, it is not an appropriate guide for
predicting the risk outcomes of corporate acquisitions, or mergers, because
when corporations diversify, management's actions can alter the underlying
risk profiles of the combining businesses. This study offers evidence that
the evolving literature of strategic management better explains the risk out-
comes of mergers.

Questions that guided this study included: What merger strategies, if
any, are best able to reduce unsystematic, or business-specific, risk? Do cer-
tain merger strategies result in a reduction in systematic, or market, risk? Are
mergers effective at reducing total risk? Finally, are the risk outcomes of
mergers sensitive to changes in general economic conditions and to leverage?

The goal of this study was not to pit one body of literature against
another nor to question the findings of modern finance that pertain to diversifi-
cation and risk within the domain of securities management. Rather, its goal
was to empirically demonstrate how, placed in the context of corporate
mergers, the underlying paradigms of strategic management can make an
important contribution towards a unified theory of risk management. Our
goal is particularly timely since researchers in strategic management (Bettis,
1983; Jemison, 1981; Lubatkin & Shrieves, 1986) and finance (Peavy, 1983)

have called for interdisciplinary research to establish the boundaries of the two fields' compatibility.

THE CONTRASTING PERSPECTIVES OF MODERN FINANCIAL THEORY AND STRATEGIC MANAGEMENT

Stockholder value has recently gained prominence as a measure of corporate performance (Branch & Gale, 1983; Pickens, 1985; Rappaport, 1983; Seed, 1985). High valuation justifies attractive compensation packages, inhibits proxy battles for corporate control, and enhances a firm's future effectiveness by allowing less costly access to additional equity and debt capital. Many executives, however, remain unsure of exactly how their firm's strategies affect stock prices. For example, a Louis Harris and Associates poll found that 60 percent of executives surveyed believed the stock of their company was undervalued (*Business Week*, 1984).

Modern Financial Theory

In response to the need to better understand how financial markets price capital investment decisions, researchers in strategic management have turned to modern financial theory and the Capital Asset Pricing Model, the analytical model developed from the theory (Lintner, 1965; Sharpe, 1964). Fundamental to modern financial theory is the observation that a combination or portfolio of risky stocks is less risky than the sum of the riskiness of its components.

Consider Mullins's (1981) example of a hypothetical island economy whose primary industry is tourism. Two publicly traded companies exist there; one manufactures suntan lotion and the other manufactures umbrellas. Although the two companies earn the same average return, clearly the suntan lotion firm performs better during sunny years and the umbrella firm performs better during rainy years. As a result, stockholders who are fully invested in either one would incur an unnecessarily high risk because fluctuations in weather conditions drive the variability in the stocks' prices. Fortunately, stockholders can eliminate that source of risk through diversifying their investment into a portfolio made up of equal amounts of the two firms' stocks, because the returns of the two securities do not move in perfect unison with weather conditions. However, stockholders cannot diversify away all sources of variability. For example, the returns for both companies will be equally tied to general economic factors that affect tourism like energy costs and disposable income.

The example illustrates an important capital market distinction between the component of a security's risk that varies unsystematically with general economic movements and the component that varies systematically. Weather represents one source of unsystematic risk. Other sources include technological change, strikes, the death of a high-ranking executive, bankruptcy, and a fire at a production facility. Such sources of risk are specific to a firm—

they do not equally affect the returns of all securities. Therefore, fully diversified stockholders do not bear unsystematic risk. Empirically, researchers estimate unsystematic risk by the variance in the error term obtained from regressing the overall returns to the stock market on the returns of a security. In that estimation process, market returns are a proxy for general movement in the economy.

To some extent, however, all corporate securities move in the same direction as the economy. Scholars call that source of variability systematic risk because it cannot be diversified away. Examples of systematic or market-related risk factors include changes in monetary and fiscal policies, the cost of energy, tax laws, and the demographics of the marketplace. According to proponents of modern financial theory, stockholders should care only about systematic risk and should price a security so that its expected return varies with its level of systematic risk. Empirically, systematic risk is the coefficient obtained for market returns regressed against a security's returns.

In its strictest form, modern financial theory contains three clear messages for managers of corporate strategy: diversification will reduce unsystematic risk, diversification will not create value for stockholders because systematic risk is not diversifiable, and managers need not be concerned with managing unsystematic and, therefore, total risk because the stock market will not reward such behavior. The evolving literature on strategic management, however, suggests three alternative messages.

Strategic Management Theory

Diversification and unsystematic risk. Proponents of modern financial theory view diversification as nothing more than a combination of two or more income streams, with some risk or variance associated with each. To the extent that the income streams are negatively correlated, as was the case with the suntan lotion and umbrella companies, the variance of the combined income streams will dramatically decline. Of course, instances of negative correlations are rare. However, when two income streams are weakly correlated, as is expected when two unrelated firms combine, modern financial theory predicts a sharp drop in the unsystematic variance in the returns of the merged firm. The more related the businesses of the two firms, the more the returns of the two are expected to be correlated, and the less reduction in risk is expected.

Although that prediction applies in instances of stockholder diversification, it may not apply for corporate diversification. When stockholders diversify, the expected variance of the combined returns is a linear extension of past variance minus the covariance between the two income streams. This familiar relationship between diversification and unsystematic risk is known as the portfolio effect.

When corporations diversify, however, the expected variance need not be a linear extension of historical variances. Diversification will not reduce unsystematic risk because management actions may alter the underlying risk profiles of the combining businesses. For example, management may inter-

vene in positive ways, introducing more effective control systems, technological advances, and improved sources of capital that may reduce the business risk of a newly acquired business. Instances of positive intervention are more likely to occur when corporate management is familiar with the product, market, and technical characteristics of a newly acquired business, as when firms pursue related diversification (Bettis & Hall, 1982). In contrast, in the words of Montgomery and Singh, "Firms pursuing unrelated diversification rely largely on highly general financial or managerial/control competencies which are not directed specifically to critical success factors of a given market" (1984: 183).

Conversely, management may introduce new sources of variance through improper planning, implementing, and controlling of a diversification process (Jemison & Sitkin, 1986). Referring specifically to mergers, Lubatkin observed, "The differences in managerial styles and control systems, the ever present threat of layoffs that come with consolidation of departments, the initial inequities in compensation, the authority superimposed on the acquired company—all bring about inefficiencies that may negate the possible benefits of merger" (1983: 222). The more related an acquired business, the more likely corporate management will undertake consolidation efforts rather than allow it to stand alone as a separate subsidiary. Further, corporate managers, feeling they know what is being acquired in a related merger, may be lulled into a false sense of security and neglect important administrative functions (Kitching, 1967). Thus, the more related the merging units, the greater will be the expected level of administrative business risk.

The first half of Table 1 summarizes the influences that offset unsystematic risk associated with various types of acquisition. Following Lubatkin's (1983) classification scheme, the table lists four types of merger: single-business mergers, including mergers between businesses that are either horizontally or market-concentrically related; vertical mergers; related mergers, involving businesses that share related production or marketing technologies; and unrelated mergers. The table is the basis for the first hypothesis:

> Hypothesis 1: Mergers, regardless of the degree of relatedness, will not reduce a firm's unsystematic risk.

Diversification and systematic risk. A firm's systematic risk, or the sensitivity of its returns to the aggregate returns of the marketplace, determines its cost of capital. The lower the systematic risk, the lower the required rate of return on an investment and the greater the number of investment opportunities; hence, the higher the value of the firm, all other things being equal (Van Horne, 1980: 68). Put another way, corporate managers can increase the wealth of their stockholders by pursuing actions that lower a firms' systematic risk.

Proponents of modern financial theory claim that systematic risk cannot be diversified away because it stems from market-wide trends that threaten all businesses. As is the case with unsystematic risk, that prediction may not apply to corporate diversification because management actions may alter the

TABLE 1
Summary of Predicted Influences on Risk

(a) Unsystematic Risk

Acquisition Strategies	Influences			
	Portfolio Effect	Positive Intervention	Administrative Pitfalls	Net Effect
Single-business mergers	No change	Large decline	Large increase	No change
Vertical mergers	Small decline	Small decline	Increase	No change
Related mergers	Decline	Decline	Increase	Small decline
Unrelated mergers	Large decline	No change	Small increase	Small decline

(b) Systematic Risk

Acquisition Strategies	Influences			
	Tangible Interrelations	Intangible Interrelations	Competitive Interrelations	Net Effect
Single-business mergers	Large decline	Decline	No change	Decline
Vertical mergers	Decline	Decline	Decline	Decline
Related mergers	Large decline	Large decline	Large decline	Large decline
Unrelated mergers	No change	No change	No change	No change

underlying risk profiles of the combining businesses. Corporate diversification can thus reduce systematic risk.

Empirical research has not widely addressed the relationship between corporate actions and systematic risk. Woo and Cool (1986) proposed a conceptual framework to facilitate research on the topic. Their framework establishes three links between strategic management and systematic risk. At the corporate level, product-market portfolio decisions affect levels of systematic risk by linking a firm to the cyclical patterns of the chosen industries. In addition, product-market portfolio decisions align a firm to specified asset and financial structures. Regarding those two points, research in the field of industrial organizations and finance has shown that systematic risk is positively related to the level of cyclicality (Brealey & Myers, 1981; Sullivan, 1978), operating leverage (Lev, 1974; Rubinstein, 1973), and financial leverage (Fabozzi & Francis, 1979; Hamada, 1972). Finally, at the business level, decisions that improve a business's ability to compete in its selected industry lead to the attainment of market power. Broadly speaking, market power is the ability to influence prices of outputs and costs of inputs. It comes from effectively positioning a business in such a way that its distinctive capabilities closely match the needs of its selected marketplace. Studies have shown that as market power increases, systematic risk decreases (Moyer & Chatfield, 1983; Subrahmanyam & Thomadakis, 1980).

The corporate level of a firm also affects levels of systematic risk by linking individual business units to certain common core technologies. Corporate product-market portfolio decisions establish the context in which single businesses develop their strategies. A business unit can better achieve

a competitive advantage if a corporate strategy provides opportunities to draw on common corporate resources. Support for that notion comes from, among others, Porter (1985), Lubatkin (1983), and Rumelt (1974). Each discussed how corporate strategies can be used to attain competitive advantage by exploiting tangible, intangible, and competitor interrelationships.

Tangible interrelationships are activities that can be shared between two business units and can result in competitive advantage through technical or scale economies. For example, a vertical acquisition might lower supply costs through increasing the efficiency of scheduling and eliminating redundant inventories. Related mergers and those that increase a firm's commitment to a single business—single-business and vertical mergers—offer many potential marketing and production economies. Unrelated mergers should offer fewer such economies.

Intangible interrelationships are those that allow for the "transference of generic skills or know-how about how to manage a particular type of activity from one business unit to another" (Porter, 1985: 324). As an example, Porter cited Philip Morris, which was able to apply the skills in product management, brand positioning, and advertising it had learned in marketing cigarettes to greatly enhance the competitive position of the Miller brand of beer.

Finally, competitor interrelationships occur when rival firms compete in more than one industry. "These multipoint competitors necessarily link industries together because actions towards them in one industry may have implications in another" (Porter, 1985: 325). Multipoint competition may force a firm to match an interrelationship or face a competitive disadvantage.

Firms that achieve competitive advantage through exploiting interrelationships can expect their returns to be somewhat insulated from the exogenous shocks that threaten all firms; in other words, those firms will be associated with lower levels of systematic risk. Consider IBM, a multipoint competitor that effectively exploits its interrelations. Will the returns of IBM be as sensitive to declines in general economic conditions as those of its less competitive counterparts? Which computer manufacturer is likely to feel the effects of adverse times first and more intensely, IBM or Burroughs? It is reasonable to presume that IBM, by virtue of its interrelationships, has distinctive options to combat economic decline. They may include raising buyers' switching costs through offering a more complete line, discounting the prices of complementary products, increasing promotion, and introducing a new technological breakthrough. To the extent that such options help to insulate IBM's returns from overall economic risk, IBM's systematic risk should be lower than its competitors'.

Additional support for the contention that competitive advantage is associated with lower levels of systematic risk comes from the literature of organization theory, in which the term organizational slack is used in a manner analogous to the use of the term competitive advantage in the literature on strategic management. For example, Cyert and March (1983) argued that slack allows organizations to maintain stability through intermittently good and bad times. Similarly, Bourgeois (1981) referred to slack as those

resources that exceed what a firm needs to pay suppliers and otherwise engage in basic business. In other words, firms with competitive advantages have slack. Conversely, firms without such advantages are unable to capture returns beyond some normal level, as defined by the minimum amount necessary for the firm to continue to compete.

The second half of Table 1 summarizes the predicted changes in systematic risk associated with each type of merger. We also developed the second hypothesis from the table. It is consistent with Porter's assertion that diversified firms that can exploit interrelationships can "overwhelm single-business competitors or competitors with poorly conceived arrays of business units" (1985: 376).

> Hypothesis 2: Systematic risk declines more in mergers that combine distinct but related business units than in mergers that do not. Specifically, (a) related mergers will lead to a large decline in the systematic risk of an acquiring firm; (b) single-business and vertical mergers will lead to a small decline in the systematic risk of an acquiring firm; (c) unrelated mergers will not influence the systematic risk of an acquiring firm.

Total risk. Total risk is defined as the total variability in a security's returns; it is the combination of the unsystematic variability and the systematic variability. Depending on the level of a corporation's diversification, the unsystematic component may vary from 70 to 80 percent of its total risk.

Although proponents of modern financial theory claim that only systematic risk matters to stockholders, strategic management theorists argue that the management of unsystematic risk, and therefore the management of total risk, are important. For example, Bettis argued that the management of unsystematic risk factors such as entry barriers "lies at the very heart of strategic management" (1983: 408). Entry barriers named in Bettis's discussion include product differentiation, technology, and cost advantages. For managers to neglect those important components of strategy, he argued, is to court corporate failure and the related adverse effect on stockholder wealth.

Organization theory, as articulated by Mintzberg (1979), and agency theory (Amihud & Lev, 1981; Eger, 1983; Fama, 1980; Jensen & Meckling, 1976) also support the importance of unsystematic and total risk. In both theories, all stockholders—customers, employees, managers, debt holders, stockholders, and others—have legitimate claims to organizational rewards. To deem the claims of stockholders as paramount amounts to an exclusive focus on systematic risk that will inhibit future cooperative efforts and therefore reduce the total rewards available from an organization.

Final arguments come from questioning the assumptions of modern financial theory. For example, its proponents assume that all stockholders are fully diversified. That is not always true, particularly for corporate executives who may be heavily invested in a single company. Also, they assume a frictionless capital market, one without such imperfections as taxes. Because taxes exist, however, firms receive rewards for improving the stability of

their income streams because they can thereby attract additional debt financing while passing a portion of the cost of capital from their stockholders to the government. Stockholders on their own cannot duplicate such a gain, for it can occur only through the actual merging of two businesses' income streams. These two examples highlight instances where strict modern financial assumptions do not hold and suggest that corporate management must attend to all components of risk.

The preceding arguments establish the importance of total risk. The third hypothesis then follows from the combined predictions of the first two. It recognizes that a merger may influence an acquiring firm's unsystematic risk in a manner that differs in direction and magnitude from its influence on systematic risk. The third hypothesis predicts a merger's net influence on risk.

> *Hypothesis 3: Total risk declines more in mergers that combine distinct but related business units than in mergers that do not. Specifically, (a) related mergers will lead to a decline in the total risk of an acquiring firm; (b) other merger types will lead to a small decline in the total risk of an acquiring firm.*

Other Influences on Risk

So far we have described the expected relationship between strategic decisions about mergers and various components of risk and assumed that other influences on risk will not have a direct bearing on results. That assumption may not, however, be sound because it does not take into account such influences as changing market conditions and leverage decisions.

Researchers have advanced various propositions regarding market conditions that suggest that the relationship between merger strategies and merger outcomes is not stable over time (Salter & Weinhold, 1982). For example, during economic downturns, or bear markets, most companies face some combination of reduced cash flows, few growth opportunities, and uncertain future cash returns. In such a high risk–low return setting, management is likely to be highly risk averse. A natural reaction is to scale back investment programs: researchers have observed that merger activity decreases during bear markets (Bradley & Korn, 1981; Kusewitt, 1985). For those mergers that are undertaken, regardless of type, it follows that management exercises special caution in planning, implementing, and controlling the acquisition processes. That caution should reduce administrative pitfalls and increase like likelihood that a firm will realize the benefits of interrelations.

An opposite pattern of behavior should occur during periods of growth, or bull markets. Flush with cash and facing an attractive set of investment opportunities, management may be less risk-averse when pursuing mergers, less motivated to reduce the variability of their firms' returns, and perhaps less attentive to merger processes.

Hypothesis 4: Mergers completed during bull markets may be associated with less risk reduction than those completed during bear markets.

Other factors in a task environment may also influence the risk-reducing properties of mergers. For example, in a companion study we focused on regulatory changes and found that mergers completed during times of stringent antitrust enforcement policies—the period from May 1968 through December 1973—were associated with less reduction in systematic risk than those completed during other periods (Lubatkin & O'Neill, 1986). Unfortunately, limitations in the size of the data set inhibited simultaneous investigation of merger types, market conditions, and regulatory conditions. However, we refer to the results of the companion study when discussing the results of the current study.

Regarding decisions on leverage structure, past studies have shown that mergers are often associated with increased debt levels (Melicher & Rush, 1974), or even motivated by increased debt (Lewellen, 1971). In addition, there is a positive relationship between a firm's debt level and its systematic risk (Hamada, 1969). Therefore, to the extent that different levels of debt motivate merger strategies, leverage could be a factor in explaining any observed variance in systematic risk.

METHODS

Sources of Data

An exhaustive list of acquiring firms was assembled by combining the 1954–73 Federal Trade Commission (FTC) large merger series, which lists acquisitions of at least $10 million in asset value, and the Center for Research in Security Prices (CRSP) monthly returns file. By limiting the population to large mergers, we focused only on those that were likely to have had a noticeable effect on market valuation. By excluding mergers completed after 1973, we avoided the difficult period that began with the energy crisis and continued to the early 1980s and the weakening of OPEC. The results of this study, therefore, may not adequately describe the outcomes of mergers completed during that period. However, the results may describe mergers of the middle 1980s fairly accurately.

An acquiring company's ownership in an acquired company had to have exceeded 50 percent so as to exclude all partial mergers. An additional criterion for inclusion was that the acquiring firms had to have been listed on the New York Stock Exchange (NYSE) for a full 67 months before the month of the merger and for a full 64 months after the month of the merger to allow us to evaluate premerger performance and postmerger performance for the combined firm. We excluded seven months of data before and four months of data after the merger month to eliminate possible biases in the regression coefficients brought about by news of a merger. Finally, a merger had to have been an isolated event, neither preceded nor followed by another large merger by the same acquiring firm during a six-year period surrounding the merger

month. That criterion ensured that the parameters estimated for the model
would reflect the influence of a single merger. A total of 297 mergers met the
requirements. Statistics about the population of mergers are available on
request.

The F.T.C. classified each merger according to the primary strategic
relationship between the acquiring and acquired firms. The scheme identi-
fies five basic merger strategies. (1) Horizontal strategies involve firms that
produce similar products in the same geographical region. (2) Vertical strate-
gies involve firms that share a buyer-seller relationship. (3) Product-concentric
strategies involve firms that produce noncompeting products that share sim-
ilar production or marketing technologies. (4) Market-concentric strategies
involve firms that produce similar products in different geographical regions.
(5) Conglomerate mergers involve firms that have dissimilar products and
markets. We then collapsed the F.T.C.'s five-strategy scheme into Lubatkin's
(1983) four-strategy scheme by pooling horizontal and market-concentric
mergers into one type, designated single-business mergers. The rationale for
combining the two came from Howell (1970), who suggested that there is
little distinction between the two, given the ever-increasing ease with which
firms can geographically expand their markets.

In order to (1) isolate possible changes in merger outcomes that were due
to economic cycles and (2) to test the consistency of the findings based on
data from all 297 mergers, we split the group into two independent parts.
Specifically, we constructed a bear market subgroup consisting of 80 merg-
ers completed during the periods designated by the Department of Com-
merce to be periods of market decline. These include the periods from De-
cember 1961 through June 1962; January 1966 through October 1966, and
January 1969 through May 1970. The bull market subgroup contained 134
mergers completed between December 1961 and December 1973 during peri-
ods of stability or growth. We omitted mergers that occurred before Decem-
ber 1961 from both subgroups because documentation on economic cycles
for that period could not be found.

Risk and Leverage Measures

The three components of risk were estimated using Lubatkin and
Shrieve's (1986) market model in the following form:

$$(r_{it} - r_{ft}) = a_i + b_i (r_{mt} - r_{ft}) + e_{it} ,$$

where t $= 1, \ldots, T,$

i $= 1, \ldots, N,$

r_{it} = the monthly rate of return on the common shares of firm i in
month t and is based on monthly closing stock prices adjusted
for stock splits, stock issues, and dividends,

r_{mt} = the average monthly rate of return of all NYSE traded securities
in month t that are listed on the CRSP returns file,

r_{ft} = the risk-free rate of return in month t, or the yield on treasury
bills with one month to maturity,

a_i, b_i = firm-specific constants, and

e_{it} = a stochastic error term assumed to meet the assumptions of the linear regression model.

Employing this technique, we obtained estimates of the historic parameters a_i and b_i (α_i and β_i) for the premerger period by longitudinally regressing 60 months of data beginning 67 months before the merger transaction month. Similarly, we estimated the model a second time for the postmerger period by longitudinally regressing 60 months of data beginning 5 months after the merger transaction month. We excluded 12 months of data surrounding the transaction month to eliminate possible temporary nonstationarities in the regression coefficients. Short-term market uncertainties caused by the announcement of and negotiation for a merger might induce such nonstationarities.

Unsystematic risk was defined by the standard deviation of the error term (e_{it}) over the 60-month estimation period. We computed an unsystematic-risk difference score for each acquiring firm by subtracting the premerger estimate of unsystematic risk from its respective postmerger measure. The difference score that results should represent the change in each firm's unsystematic-risk characteristics that is due to merging. A positive difference score means that risk has increased. By its construction, the difference score implicitly controls for size and other nonmerger, firm-specific characteristics, to the extent that the premerger risk estimates reflect those characteristics.

Similarly, a systematic-risk difference score was computed for each acquiring firm by subtracting the premerger estimate of b_i from its respective postmerger measure. The difference score that results should represent the change in each firm's systematic risk characteristics that is due to merging.

A total-risk difference score was computed for each acquiring firm by subtracting the premerger estimate of total risk from its respective postmerger measure. We defined total risk as the standard deviation of a firm's excess returns, or a firm's returns in excess of the risk-free rate, less the standard deviation of the market's excess returns. The normalizing procedure helps to control for changing market-wide influences that could bias categorical averages when estimates of total risk are pooled across time.

Finally, a leverage difference score was computed for each acquiring firm by subtracting each five-year premerger estimate of leverage from the firm's five-year postmerger estimate. We defined leverage as the book value of a firm's long-term debt divided by the book value of its total assets.

Each difference score was then averaged with those computed for other merging firms of the same type. We used a two-tailed t-test to access whether the difference score in each instance differed from zero and conducted a one-way analysis of variance to see whether significant differences in each risk score existed across the four merger-strategy types. Finally, we used a Scheffé test of multiple comparisons to assess differences among the three possible pairs of merger strategies for each variable. This ANOVA-based

technique uses a statistic that follows an F-distribution to make pairwise comparisons.

RESULTS AND DISCUSSION

Table 2 summarizes the unsystematic-, systematic-, and total-risk difference scores by merger type. Strong support emerged for the first hypothesis. Regardless of how related merging businesses may be, the level of acquiring firms' unsystematic risk *increases* following mergers. The second hypothesis, concerning the effects of merging firms' relatedness on the systematic risk of the acquiring firm, was also supported. The decline in systematic risk associated with related mergers is large and significant. No other merger strategy revealed a significant decline. A one-way analysis of variance, however, failed to reveal significant differences in systematic risk outcomes across merger strategies. The fact that the mergers analyzed were pooled across differing market climates may account for that lack. The third hypothesis, on the effects of merging firms' relatedness on total risk, received partial support. Contrary to expectations, single, vertical, and unrelated mergers are generally not associated with small declines in total risk. Indeed, the results suggest that each is associated with small increases, although the observed increases may be due to chance. As was expected, related mergers are generally associated with a significant decline in total risk, although the decline may not be statistically distinguishable from the total-risk difference scores observed for the other types of mergers.

The fact that mergers do not appear to represent an effective means to reduce unsystematic, or business-specific, risk has important implications for corporate managers. As Salter and Weinhold (1979) observed, managers expend much effort on such very real company-specific risks. It is not surprising, therefore, that managers often justify mergers on the basis of their potential to reduce such unsystematic risk factors as dependence on a single

TABLE 2
Average Differences in Risk Merger Type [a]

Types of Mergers	N	Unsystematic Risk		Systematic Risk		Total Risk	
		Means	s.d.	Means	s.d.	Means	s.d.
Single-business	66	.0066**	.0187	−.0051	.4216	.0021	.0216
Vertical	41	.0066*	.0170	−.0216	.3494	.0011	.0208
Related	130	.0059**	.0179	−.1182**	.3944	−.0036*	.0193
Unrelated	60	.0093**	.0206	−.0543	.3706	.0007	.0218
Total	297	.0069**	.0185	−.0668**	.3912	−.0008	.0206
F[b]		0.45		1.51		1.49	

[a] A two-tailed t-test was used to assess the probability that each difference score differs from zero; $N = 297$.

[b] A one-way ANOVA design was used to test the significance of the differences in each average risk score across the four merger types.

*$p < .05$
**$p < .05$

product or service and seasonal and cyclical fluctuations in their present businesses. The results reported here, however, clearly show that such a rationale is not valid for most mergers.

Very different outcomes would be expected in light of modern financial theory. It is well documented that an investor can eliminate the unsystematic risk of any security by a policy of portfolio diversification. However, we did not observe that phenomenon in instances of corporate diversification, even in the extreme case of unrelated mergers. By definition, we would expect the returns of two unrelated businesses to be at least weakly correlated. In addition, risk reduction commonly motivates unrelated mergers. Finally, the acquiring firms we studied were merger-inactive. Because they participated in no other major merger over a six-year period, the subject event may have represented the first recent diversification effort for many of the firms. Proponents of modern financial theory expect the greatest reduction in unsystematic risk to occur at the point of first diversification. These three conditions suggest that the unrelated mergers in this study should have been associated with a reduction in business risk, yet the opposite pattern emerged: unrelated mergers were associated with the largest increases in unsystematic risk of any of the merger types we studied.

The findings therefore point out a fundamental difference between the ability of a securities manager and a corporate manager to reduce unsystematic risk. A corporate manager faces the complex and uncertain task of managing an acquired business. As was discussed, administrative pitfalls develop, and they seem to add at least as much business-specific risk as a pure portfolio effect removes.

The findings on systematic risk are important because they suggest that related mergers can achieve a reduction in risk that stockholders cannot achieve on their own. This reduction in systematic risk enhances a firm's future effectiveness, for low systematic risk implies a low cost of capital, and a low cost of capital enables a firm to participate in a wide set of investment opportunities. These investments might in turn allow a firm to solidify its position in its current domains or expand to new domains.

Once again, very different outcomes would follow from modern financial theory, according to which the systematic risk of a security is the proportion of total risk that cannot be avoided, regardless of level of diversification. The finding involving related mergers therefore underscores the distinction between modern financial theory and strategic management theory and suggests that, in instances of corporate diversification, general market risk has both uncontrollable and controllable components.

The findings concerning total risk, along with what emerged concerning the two components of total risk, suggest that firms should not pursue single, vertical, and unrelated mergers when their overriding objective is to reduce their exposure to environmental uncertainties. This is an important observation, as mergers are often pursued to reduce risk. In contrast, related mergers are associated with a significant decline in total risk. The results of the tests we performed suggest that decline in total risk is due solely to the

ability of related mergers to reduce the systematic component of total risk. We found that the unsystematic component increased following related mergers. The offsetting influences of the two risk components highlights the complexity of strategic actions. For example, when a management erects entry barriers to reduce the risk of attacks by competitors, is it reducing unsystematic risk, as Bettis (1983) and others maintained, or systematic risk, as we argue, or both? The question becomes more complex when, as Peavy (1984) asserted, the two are not totally independent, because the calculation of a firm's systematic risk depends somewhat on the standard deviation of its stock's returns, or total risk.

The findings of this study do not directly address that question. It may be that the causes of the two components of risk cannot be separated either empirically or practically. However, the results do suggest that although the management of unsystematic risk "lies at the very heart of strategic management" (Bettis, 1983: 408), so does the management of systematic risk. The practical implications are clear: to the extent that corporate managers are concerned about risk, they should focus their attention on building competitive advantage in each market in which they participate.

ADDITIONAL EVIDENCE

Bear and Bull Markets

The results presented in Table 3 generally support Hypothesis 4, concerning bear and bull markets. For three of the four merger types, bull-market mergers are less effective at reducing unsystematic, systematic, and total risk than bear mergers of the same type. Unrelated mergers represent a notable exception. Perhaps firms that engage in unrelated mergers during bear markets find themselves stuck with poor competitive positions in markets that offer few opportunities to improve their positions through efforts at related diversification. Those firms may therefore be willing to accept high levels of risk in attempts to escape from their current market domains. Support for that contention comes from Weston and Mansinghka, who argued that the primary motivation for conglomerate formation is "to avoid adverse effects on profitability from developments taking place in the firm's traditional product market areas" (1971: 928).

The ANOVA results presented in Table 3 provide additional evidence that the merger market is not homogeneous across time but is influenced by changing market conditions, among other factors. We detected significant differences across merger categories for outcomes involving unsystematic, systematic, and total risk for bull-market mergers, but no significant categorical differences emerged for bear-market mergers. Further, a Scheffé test of multiple comparisons (not presented) revealed the results of at least one categorical comparison of systematic risk outcomes, the comparison of related and single-business mergers, to be significantly different at the .05 level. It also showed at least two categorical comparisons of total-risk

outcomes—related and single, and unrelated and single—to be significantly different at the .05 level.

Finally, the results presented in Table 3 are generally consistent with those presented in Table 2 and therefore provide additional support for the first three hypotheses. First, mergers are probably not effective in lowering a firm's unsystematic risk (Hypothesis 1). We found support for that conclusion in both economic environments, although the evidence is more striking for bull-market mergers. During bull markets, all merger types are associated with significant, positive increases in unsystematic risk. Second, related mergers are generally associated with a large decline in systematic risk (Hypothesis 2), regardless of market conditions. In a previous study (Lubatkin & O'Neill, 1986), we reported similar results. We investigated the influence of regulatory changes and found that related mergers are generally associated with a large decline in systematic risk, regardless of regulatory conditions. Market conditions, however, do seem to moderate the systematic-risk outcomes of the other three merger types, particularly single-business mergers.

TABLE 3
Average Differences in Risk by Merger Type
for Bear and Bull Market Subgroups[a]

Outcomes/Sample	Bear			Bull		
	N	Means	s.d.	N	Means	s.d.
Unsystematic risk						
Single-business	20	.0074	.0235	17	.0198**	.0217
Vertical	13	.0034	.0149	18	.0095*	.0146
Related	24	.0082	.0237	67	.0091**	.0163
Unrelated	23	.0146**	.0215	32	.0072*	.0190
Total	80	.0091**	.0217	134	.0101**	.0177
F [b]		0.84			2.12^{+}	
Systematic risk						
Single-business	20	−.0429	.4199	17	.2507**	.2417
Vertical	13	−.0674	.3162	18	.0642	.3424
Related	24	−.2211**	.3995	67	−.1415**	.3818
Unrelated	23	.0141	.4297	32	−.0364	.3898
Total	80	−.0840^{+}	.4055	134	−.0390	.3834
F [b]		1.46			5.83**	
Total risk						
Single-business	20	−.0007	.0278	17	.0166**	.0210
Vertical	13	−.0056	.0187	18	.0041	.0196
Related	24	−.0089^{+}	.0246	67	−.0028	.0196
Unrelated	23	.0050	.0255	32	−.0008	.0223
Total	80	−.0023	.0251	134	.0010	.0212
F [b]		1.34			4.28**	

[a, b] See the corresponding footnotes to Table 2.

$^{+}$ $p < .10$

* $p < .05$

** $p < .01$

Finally, the results concerning total risk are somewhat ambiguous. Although related mergers once again tend to be associated with a decline in total risk, the decline observed during bull markets is small and probably due to chance. The emergent conclusion, therefore, is that mergers are probably not effective in reducing total risk during bull markets.

Leverage

Table 4 presents the average leverage difference scores by merger type for the 114 mergers that met the data requirements. Also presented are the average systematic-risk difference scores for the same set of mergers. The pattern of risk results is consistent with those presented in the previous tables. Indeed, an ANOVA model reinforces the superior capacity of related mergers to reduce systematic risk. An overall F-statistic of 2.99 was significant at the .03 level, suggesting that at least one comparison—between related and single-business mergers—reveals a difference that cannot be attributed to chance. Leverage does not, however, explain the contrast. Rather, related mergers revealed an increase in leverage that is significant and large compared to the other merger types. This finding provides strong support for the second hypothesis because the decline in systematic risk appeared for related acquisitions despite an increase in leverage.

CONCLUSIONS

This paper reports the results of a study that examined changes in risk associated with a large group of acquiring firms, grouped by the degree of relatedness of their mergers. The findings show that risk reduction may be a valid rationale for mergers, but not for the reasons often cited. On the average, we found that mergers tend to be associated with increased levels of unsystematic and total risk. This finding is inconsistent with predictions based on

TABLE 4
Differences in Leverage and Systematic Risk[a]

Types of Mergers	N [c]	Changes in Leverage[d]		Changes in Systematic Risk	
		Means	s.d.	Means	s.d.
Single-business	17	.0110	.0748	.0826	.3153
Vertical	14	.0189	.0597	.0324	.3507
Related	51	.0504**	.0794	−.1794**	.3456
Unrelated	32	.0237	.1227	−.0787	.3878
F [b]			1.17		2.99*

[a, b] See the corresponding footnotes to Table 2.

[c] Data are for the 114 mergers in the full group of 297 that are listed on COMPUSTAT® data files for the five years before and after the year of a merger.

[d] Leverage is defined as the book value of a firm's long-term (five-year) debt divided by the book value of its five-year average total assets.

* $p < .05$
** $p < .01$

modern financial theory and therefore points out a fundamental difference between the challenges facing securities managers and corporate managers. The findings also show that at least one type of merger—that involving related businesses—demonstrates the ability to reduce systematic risk regardless of market conditions. Although inconsistent with modern financial theory, that finding is grounded in the evolving literature of strategic management. Finally, the findings suggest that market conditions influence the ability of merger strategies to influence risk.

The results have important managerial implications. First, with the exception of those mergers that involve related businesses, little evidence emerged to suggest that mergers represent an effective means of lowering risk. The conclusion is surprising, for executives frequently justify a merger on the basis of its risk-reducing properties. Second, related mergers generally achieve a reduction in risk that stockholders could not achieve on their own. That finding highlights an important distinction between corporate strategy and portfolio strategy and suggests that corporate managers should focus their attention on building competitive advantage in each participating market rather than pursue new markets for the sole purpose of hedging corporate bets. Finally, managers need to focus strong attention on issues of merger implementation. In general, we saw no decline in unsystematic risk from a portfolio effect, which suggests that administrative pitfalls inherent in the acquisition process contributed at least as much business risk as the portfolio effect removed.

This study had several limitations. For example, we did not control for the relative sizes of the merging firms other than to set a minimum cut-off point of $10 million for the book value of acquired assets. Other controls not considered include the merging firms' labor-capital ratios (Subrahmanyam & Thomadakis, 1980), operating leverage (Lev, 1974; Rubinstein, 1973), and levels of R & D activity. Also not considered are the structural characteristics of the merging firms' selected industries (Brealey & Myers, 1981; Sullivan, 1978). Previous investigation has shown such firm-specific and industry-specific characteristics to affect systematic risk. Further, although the present study controlled for possible confounding effects of other major merger activity, it failed to control for a multitude of other firm-specific events such as divestitures, changes in top management, and exchange offers. Finally, although we controlled for environmental changes associated with changing market conditions, we failed to control for other environmental influences, such as regulatory changes (Armour & Teece, 1978; Lubatkin & O'Neill, 1986; Schipper & Thompson, 1983; Shelton, 1985).

This study extended the literature concerning merger strategies and economic performance and in the process made a contribution by testing contrasting perspectives drawn from the literatures of strategic management and modern financial theory. Alternative explanations highlight opportunities for future study.

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INTERCULTURAL TRAINING FOR MANAGERS: A COMPARISON OF DOCUMENTARY AND INTERPERSONAL METHODS

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Although much attention has been devoted to the issue of managerial training and development, little research has specifically focused on preparing managers for intercultural work. The present study examined documentary and interpersonal training methods of preparing managers to go overseas for their company. The effects of the two training techniques on managerial performance, perceived intensity of adjustment to a new culture, and international perspective were compared in an experiment with a two-factor, crossed-factorial design. The results demonstrate that documentary and interpersonal training methods have additive benefits in preparing managers for intercultural work assignments.

The importance of training in preparing an individual for an intercultural work assignment has become increasingly apparent (Baker, 1984; Lee, 1983; Tung, 1981). In general, intercultural training may be defined as any procedure intended to increase an individual's ability to cope and work in a foreign environment (Tung, 1981). The present study compares the relative effectiveness of several training techniques in preparing managers for intercultural work assignments.

A previous study (Henry, 1965) documented the need for companies to prepare operatives assigned to work in a different culture. After reviewing the placement decisions of some American multinational companies, Henry found that the companies reported 30 percent of their placements to be mistakes—primarily due to the employees' failure to adjust properly to a new culture. Lee and Larwood (1983) examined the process of acculturation occurring for expatriate managers in multinational companies. Using role theory as a base, they suggested that expatriate managers will tend to adopt expected roles in a new culture so as to avoid role conflicts between the new and the home cultures. Further, they suggested that individuals could avoid some role conflict through anticipatory socialization in which they obtained advance information about a new culture and adopted their anticipated roles. Anecdotal evidence presented by Baker (1984) also illustrates the need for intercultural training. He reported the story of an American manager who

attended a party while working in a Middle Eastern country. During the party, the manager inquired as to a native colleague's family. Because the constraints of that particular culture permit such an inquiry only among people who know one another quite well, the American alienated the colleague.

A major objective of intercultural training is to help people cope with unexpected events in a new culture. An individual overwhelmed by a new culture will be unable to perform required work duties effectively. Further, an ill-prepared individual may inadvertently offend or alienate a foreign host and perhaps jeopardize existing long-term relations with a host country. Thus, an objective of training is to reduce conflict due to unexpected situations and actions. The generalized trauma people experience in new and different cultures because they must learn and cope with a vast array of new cultural cues and expectations is referred to as culture shock (Harris & Moran, 1987: 88–89). Scholars have generally thought that culture shock reduces ability to function in a cultural setting because of perceived discrepancy between an individual's expectations of how events should proceed and how they actually occur. The level of culture shock an individual experiences is positively related to the individual's perceived need to adjust to a new culture. If, for instance, an American visiting a developing country expects to use a local library's photocopier, there is likely to be a discrepancy between expectation and events owing to the unavailability of high technology. The accumulative effect of such discordant events is a stress state resulting in culture shock (Spradley & Phillips, 1972).

There are a variety of training techniques available to prepare people for intercultural work assignments and thereby reduce the level of culture shock they will experience. Tung (1981) provided a classification that is useful in distinguishing among intercultural training methods: (1) area studies, or documentary programs, which expose people to a new culture through written materials on the country's sociopolitical history, geography, economics, and cultural institutions; (2) culture assimilator, a programmed instruction method that exposes trainees to specific incidents critical to successful interaction with a target culture; (3) language preparation; (4) sensitivity training, in which people's self-awareness is increased; and (5) field experiences, or exposing trainees to mini-cultures within their own country during short field exercises. Tung suggested that the methods should be considered complementary and part of a continuum ranging from low to high levels of "rigor," with area studies at the low end and sensitivity training at the high end (1981: 70). Thus, rigor indicates the level of trainees' affective involvement in a training method. The negative reaction most educators and trainers have to documentary forms of training (Carroll, Paine, & Ivancevich, 1972; Goldstein & Sorcher, 1974) suggests that an experiential approach is preferable to a documentary approach. In a discussion of the importance of experiential involvement in learning, Certo (1976) concluded that experiential learning is often more effective than more passive forms of learning like traditional classroom work.

      Pazy and Zeira (1983) distinguished between on-site and off-site forms
of intercultural training for professionals. They suggested that sending pro-
fessionals to new cultures for training can benefit them through, among
other things, enhancing their adaptability and flexibility. Lee (1983) dis-
cussed the orientation program used by the Arabian American Oil Company
in preparing American managers and their families for stays in Saudi Arabia.
The company provides an orientation program for their employees consist-
ing of two parts: practical information on local transportation, shopping,
day-to-day finances, and the like; and a comparison of the beliefs and cus-
toms of the Saudi people with those of Americans through documentary
materials.

      The present study consisted of a competitive test of two forms of intercul-
tural training. Its purpose was to determine what types of training are most
effective in preparing people for overseas work assignments. Having decided
to test the two extremes of rigor in Tung's (1981) classification, I contrasted a
documentary approach and an approach employing sensitivity training and
field experience. The purpose of examining the two extremes was to distin-
guish the contribution of the affective involvement characteristic of interper-
sonal training from the contribution of general area studies and specific
critical incidents involved in a documentary approach (Kolb & Fry, 1975;
Tung, 1981). Constraints imposed by the participating company prevented
testing of intermediate forms of training.

      Given the lack of previous empirical research in this area, my hypothe-
ses were tentative. First, it seems that people's performance is related to the
perceived amount of adjustment they need to make to a new culture. As this
need to adjust increases, so does culture shock, and consequently, work
performance suffers.

> *Hypothesis 1: Individuals receiving documentary, or area
> studies, training will experience less perceived need to
> adjust to a new culture than individuals not receiving
> such training.*

> *Hypothesis 2: Individuals receiving sensitivity and field
> experience, or interpersonal, training will experience less
> perceived need to adjust to a new culture than individuals
> not receiving such training.*

> *Hypothesis 3: Interpersonal training will be more effective
> in reducing an individual's perceived need to adjust to a
> new culture than documentary training.*

> *Hypothesis 4: Performance will be inversely related to an
> individual's perceived need to adjust to a new culture.*

      In the documentary training used in this study, trainees received written
materials that compared the United States and the target countries in terms
of general aspects like politics, economics, religion, and history as well as
specific aspects like food, relationships between men and women, and cul-

turally defined gestures. In this sense, the documentary training consisted of general information concerning the target culture (area studies) as well as specific comparative information important for daily functioning in the target culture (critical incidents). The interpersonal approach consisted of several role-playing and experiential exercises designed to increase people's self-awareness, their awareness of other cultures, and their openness to accept unfamiliar modes of behavior and value systems (Kolb & Fry, 1975; Tung, 1981).

METHODS

Participants

The participants were 80 managers employed by a U.S. manufacturer of electronic products; 63 were men and 17 were women. Their participation in the study was a mandatory part of their preparation for traveling overseas. Their company was sending them to Seoul, South Korea for three months to teach the production and manufacturing techniques that several assembly plants being set up there would be using. The company's personnel department had chosen them for the assignment on the basis of their past performance records, recommendations by their current supervisors, and the impressions they made on members of the personnel department. During initial meetings, the managers described the international assignment to me as a desirable, but not essential, task for their career goals. Although the assignment was not highly prestigious, the personnel department viewed it as a positive career move for the managers chosen. The mean age of the managers was 33.6 years and their mean tenure with the company was 8.7 years. All of the participants had college degrees, were employed in the research and development division of the company, and were at the same level in the organization, that is, low-level management.

South Korea can be characterized as a newly emerging international exporter; however, the country still faces many of the difficulties of a developing nation, including low GNP, political instability, and concern over the social welfare of its populace. Each manager was to serve as an advisor and observer in one of three manufacturing facilities; the personnel department randomly assigned them to one of the three factories. Although the primary focus of their work was technical, they were required to work and to interact extensively with the nationals. The Korean employees generally spoke English, but a translator was available for circumstances in which a national did not speak fluent English. The company also expected managers to interact with Korean nationals in nonwork settings like receptions, dinners, and recreational activities. The only language problems that might arise for the managers would be during activities like shopping and interacting with residents of the local community.

Given the brevity of the assignment, the company did not send the managers' families with them. The company did arrange housing and finan-

cial details for all managers. They received no formal vacation time during their stay but were free during nonwork time.

Research Design

The study consisted of an examination of two forms of training, documentary and interpersonal, in a crossed-factorial design having 20 participants in each condition. Participants received no training, documentary training, interpersonal training, or a combination of documentary and interpersonal training. I randomly assigned participants to each condition. The interpersonal training manipulation had two levels: participants either did or did not receive interpersonal training through three experiential and role-playing exercises during the course of a three-day training seminar. The documentary training similarly consisted of two levels: participants either did or did not receive detailed written materials to study comparing the United States to South Korea in broad areas like politics, economics, and religion and in specific areas like foods eaten, methods of greeting others, and time schedules for various daily events. The specific information about South Korea presented in the interpersonal and documentary forms of training was kept as similar as possible, so the primary difference between the two forms was the instructional mode.

Regardless of their training condition, all participants received some language training, briefings concerning company operations in the foreign locale, and a cursory three-page background description of South Korea.

Content of Training

Members of the personnel department whom I had briefed conducted all training.

The interpersonal approach. The interpersonal training employed three exercises. The first consisted of a role-playing game, *BaFa BaFa*. Participants played members of either a mock materialistic, trading culture or a mock highly interpersonal, matriarchal culture. After the game, the personnel representatives and I conducted a group discussion concerning the nature of the roles enacted and how assumed roles and rules can inhibit effective intercultural contact. The discussion was not intended to cover any specific material concerning South Korea but rather to be a general introduction to the nature of cultures and how they differ.

The second exercise consisted of a simulated cocktail party at which members of the personnel department posed as foreign managers. The personnel representatives participating in the simulation had themselves worked in Korea and were quite familiar with the customs and practices of the Korean people. In addition, I worked with them to plan the types of interactions that figured in the cocktail party — greetings and introductions, modes of interacting, and topics to be discussed. The trainees were instructed to observe the various interactions and to mingle. They participated in the exercise in groups of five, with four personnel representatives posing as

nationals in each session. The personnel representatives attempted to maintain consistent traits and habits in their roles. The characteristics most heavily stressed were the etiquette and the styles of interaction trainees should expect in Korea. I observed the various sessions to ensure that they were comparable. Again, a discussion ensued at the end of the exercise. Trainees stated their reactions to the exercise, and the personnel representatives pinpointed key, or critical, incidents differentiating American and Korean customs.

For the final exercise, the managers went to a specified ethnic community on a weekend to conduct a community exploration. Organizations like the Peace Corps and educational groups like the InterFuture Scholars Program use this technique. Participants are instructed to spend three to four hours in an ethnic neighborhood and to learn as much as possible about the community during the time. Encouraged to speak with a wide variety of people about topics like politics, family orientation, and day-to-day living, they individually wander about the community speaking to shopowners and people on the street. Typically, the community chosen is significantly different from the participants' own. In the present context, we asked the trainees to explore a middle-class Asian community in which members of many different Asian ethnic groups lived. The site was chosen because of its similarity to the participants' actual destinations. It was a heterogeneous community, but many of the interpersonal skills trainees could acquire were transferable across various Asian cultures (Harris & Moran, 1987). During the following week, the managers were brought together for a two-hour group discussion on the Asian communities they had explored and the idea of a community in general. During the discussion, the personnel representatives again presented the specific critical incidents mentioned in the documentary materials.

The documentary approach. The documentary materials offered an in-depth comparison between the United States and Korea. The personnel department and I prepared the materials, drawing on government-published reports and books, critical incidents described by Westerners who have been overseas, and reports generated by the company. In an attempt to enhance awareness of self and others, we emphasized a comparison approach between the countries at general and specific levels of information and critical incidents differentiating U.S. and Korean customs. For example, there was a specific comparison of how subordinates speak with a superior in each culture. In the United States, subordinates make short eye contact with a superior; in Korea, subordinates divert their gaze and make eye contact only when answering questions posed by a superior. Other topics included techniques for greeting a business colleague, how to address others, the importance of religious beliefs in everyday life, the meaning of interpersonal power, role expectations based on gender and age, general etiquette, and the role of privacy.

Dependent Measures

Before participants returned to the United States, their supervisors in Korea rated their performance using these four items: (1) How would you rate this employee's overall performance? (2) How would you rate this employee's ability to get along with others? (3) How would you rate this employee's ability to get required assignments completed on time? and (4) How would you rate this employee's quality of performance? Each item was rated on a 6-point scale with 1 = poor and 6 = excellent. The supervisors made the ratings before the participants returned to the United States. The reliability (α) of the items was .87. I averaged the responses to obtain a composite score. In addition, the participants provided a self-assessment using the same items (α = .82). Given the high correlation between the supervisory and self-ratings on performance (r = .79, p < .01), I averaged the two indexes to obtain a composite performance score for use in the analyses.

Adjustment to the new culture was assessed with an adaptation of a scale developed by Spradley and Phillips (1972).[1] The scale assesses the perceived length and intensity of adjustment, not willingness to adjust; it compares what individuals experience to what they expected to experience. A low adjustment-needed score indicates that an individual has had little difficulty adjusting to a new culture, and a high score indicates a difficult adjustment. An underlying assumption of the scale is that an individual who is unfamiliar with a culture will perceive a greater need to adjust than an individual who is familiar with the culture (Spradley & Phillips, 1972). The 33 items in the scale, the instructions for answering them, and the response format appear in the Appendix. Responses were averaged for a composite score (α = .78).

An exploratory measure, intended to be only suggestive, assessed whether training influenced how cosmopolitan or international in their outlook participants were. Cosmopolitan managers are sensitive to others and their perspectives and will adapt and change their attitudes and values if such change is appropriate from a new cultural perspective (Harris & Moran, 1987: 1–11). Individuals were asked to recall how often they had engaged in activities indicating an international focus during the one to two months after their training but before their trip overseas. Examples of activities with an international focus were going to an ethnic restaurant, reading a foreign newspaper, attending a lecture on another culture, or watching a television special on another culture. Each of the 15 activities was rated on a 5-point scale where 1 = never and 5 = extremely often and responses were averaged (α = .71).

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[1] The only adjustment made to the original scale was that each item was rated on a 6-point scale instead of with the relative-anchor discrepancy score used by Spradley and Phillips. They gave one item—type of food eaten—an arbitrary value of 500 points and asked respondents to assign the remaining items a point value higher or lower than the relative anchor of 500 points. The purpose of the change in the scale's format was to clarify the index for the participants and to simplify scaling the items.

Training Checks

Given the nature of the training methods used in the present study, traditional manipulation checks like "How much of 'X' did you do?" did not appear to be appropriate. Instead, I made a check to ensure that the managers had participated in their training exercises, asking them if they had completed their training. For the interpersonal training, participation or lack of it was quite evident from attendance patterns. For the documentary training, all of the managers reported that they had carefully read over the materials they had received.

Two items assessed the amount of training individuals perceived themselves as having received. Participants were asked (1) How much specific information did you receive concerning your destination culture? and (2) How much general information did you receive concerning your destination culture? Both items had 5-point scales with 1 = very little and 5 = a large amount. The responses were averaged.

An additional check was made to determine whether or not an individual's overseas supervisor was aware of the specific form of training the individual had received. The supervisors were asked, "Were you aware of the intercultural preparation this employee received prior to coming to South Korea? (yes or no) If yes, please describe what type of training this employee might have received."

Procedures

All the managers assigned to go to Korea participated in a three-day training seminar about a month before leaving for overseas. The seminar focused on a wide variety of activities, including specific technical training, language preparation, briefing on foreign personnel, travel arrangements, and intercultural preparation. The last category was systematically varied during the course of this study. Each of the interpersonal training exercises was conducted on a separate day and took one to two hours to complete. For the documentary training, participants took the written materials home to review at their leisure. During the last day of the seminar, the trainers asked participants if they had any questions and gave them a short questionnaire containing the manipulation checks. The trainers asked the participants not to discuss or share specific aspects of their training with others, explaining that the personnel department was trying to see how effective various types of training exercises were in easing the transition for managers. About a month later, shortly before they left for South Korea, the participants completed a second short questionnaire assessing their cosmopolitanism.

After the trainees had been overseas for two months, the company's personnel department administered the questionnaire assessing their perceived intensity of adjustment to the new culture and self-rated performance. Supervisors made their performance ratings and their responses on the check of their awareness of participants' training immediately before the participants returned to the United States.

RESULTS

Training Checks

The training checks were analyzed using a two-way analysis of variance. The results demonstrate that both forms of training were effective. Individuals who received documentary training recalled receiving more information than individuals who did not receive documentary training ($F_{1,76}$ = 43.81, $p < .05$; $\bar{x}$ = 4.31, 2.64). Similarly, individuals who received interpersonal training recalled receiving more information than individuals who did not receive interpersonal training ($F_{1,76}$ = 27.51, $p < .05$; $\bar{x}$ = 4.11, 3.07). In addition, the amount of information received by individuals who received only documentary training ($\bar{x}$ = 3.93) did not significantly differ from the amount of information received by individuals who received only interpersonal training ($\bar{x}$ = 3.66). No significant interaction effects emerged.

Responses to the item investigating the overseas supervisors' awareness of the form of training a participant had received were analyzed with a chi-square analysis within each of the four experimental conditions. The number of no responses did not differ significantly from the total number of responses in each condition (χ^2 = .20, .00, .45, and .20, 1 df, n.s.). No responses = 18 (90%), 20 (100%), 17 (80%), and 18 (90%) for those who received neither documentary nor interpersonal training, those who received only documentary training, those who received only interpersonal training, and those who received both forms of training, respectively. In other words, the supervisors did not know what training each subject had received. An analysis for the number of no responses made across the four conditions also demonstrated no significant differences (χ^2 = 1.10, 3 df, n.s.). Thus, the supervisors appeared to be comparably unaware of what intercultural training individuals had received.

Descriptive Statistics

Table 1 presents the means, standard deviations, and intercorrelations for performance, perceived intensity of adjustment to a new culture, cosmopolitan perspective, and self-rated performance. The pattern of correlations supports Hypothesis 4, which states that performance will be related to intensity of adjustment to a new culture.

Tests of Hypotheses

To test the first two hypotheses, a two-way univariate analysis of variance (ANOVA) was conducted on the composite score for performance, and a two-way multivariate analysis of variance (MANOVA) was conducted on perceived need to adjust and cosmopolitan perspective. Table 2 presents results of the analyses. The results demonstrate support for Hypothesis 1, stating that documentary training will reduce the perceived intensity of adjustment to a new culture, and for Hypothesis 2, which makes a similar prediction concerning interpersonal training. Results also supported Hypothesis

TABLE 1
Means, Standard Deviations, and Intercorrelations

	Training Received								
	No Documentary		Documentary						
Variables	No Inter-personal	Inter-personal	No Inter-personal	Inter-personal	2	3	4	5	6
1. Performance rating by supervisor					-67^*	52^*	79^*	37^*	41^*
Means	2.90	4.25	4.15	4.90					
s.d.	1.02	0.85	1.39	0.97					
2. Intensity of adjustment[a]						-57^*	-65^*	-56^*	-41^*
Means	3.65	2.80	2.40	1.05					
s.d.	1.04	0.78	0.82	1.23					
3. Cosmopolitan perspective							60^*	50^*	39^*
Means	2.05	3.00	3.25	4.10					
s.d.	1.15	0.65	0.79	0.91					
4. Performance, self-rating								25^*	44^*
Means	2.75	4.05	3.65	4.15					
s.d.	0.64	0.83	1.04	0.88					
5. Documentary training[b]									00
6. Interpersonal training[b]									

[a] A higher score indicates a higher level of perceived intensity of adjustment needed.
[b] Dummy coded with 0 = no training, 1 = training.
* $p < .01$

4, stating that performance will be inversely related to perceived need to adjust. In general, managers who received either form of training were better performers and perceived less need to adjust to the new culture than individuals who received no such training.

Hypothesis 3 predicted that interpersonal training would be more effective than documentary training in reducing perceived need to adjust. I tested the hypothesis with a planned comparison (t-test) of the condition in which trainees received only interpersonal training ($\bar{x}$ = 4.15 and 3.60 for performance and perceived intensity of adjustment, respectively) with the condition in which trainees received only documentary training ($\bar{x}$ = 4.25 and 3.20 for performance and perceived intensity of adjustment, respectively). Results failed to support the hypothesized superiority of interpersonal over documentary training. Performance and perceived intensity of adjustment did not significantly differ between those individuals who received only documentary training and those who received only interpersonal training.

In addition to the tests of the hypotheses, analyses were conducted on cosmopolitan perspective (Table 2). The results of the analyses demonstrate main effects for both documentary and interpersonal training. Cosmopolitan perspective was significantly higher for those individuals who received documentary training than for individuals who did not receive documentary training; this pattern was replicated for the interpersonal training.

Preferences of Specific Methods

In addition to testing the hypothesized relationships, participants' preferences for the various component parts of the training were assessed. Participants who received both forms of training reported how much they liked each of the various methods, using a scale with 1 = not at all liked and 5 = very much liked. Rankings, from least to most preferred, were: documentary booklet (general, $\bar{x}$ = 2.6), documentary booklet (specific, $\bar{x}$ = 2.9), interpersonal culture game ($\bar{x}$ = 3.9), interpersonal cocktail party ($\bar{x}$ = 4.3), and interpersonal field experience ($\bar{x}$ = 4.5). The pattern suggests that the participants strongly preferred the interpersonal form of training.

DISCUSSION

The results of the study demonstrate the importance of preparation for managers traveling to a new and different culture. Both the documentary and interpersonal approaches had beneficial effects on managerial performance overseas, apparently by reducing the perceived intensity of their cultural adjustment. In addition, the effects of the two forms of training were found to be independent and additive. Individuals who received documentary and interpersonal training also had a generally more cosmopolitan outlook than individuals who did not receive documentary and interpersonal training.

The present study found the documentary and interpersonal approaches to be comparably effective, suggesting that some commonality of effects exists. Examining the specific definitions of the two approaches might better explain what led to effective intercultural training. Both the documentary and

TABLE 2
Results of ANOVA and MANOVA Analyses

Dependent Variables	MS	F^a
Performance[b]		
Documentary training	18.05	15.61*
Interpersonal training	22.05	19.65*
Documentary × interpersonal	1.80	1.56
Intensity of adjustment[c]		
Documentary training	45.00	46.53*
Interpersonal training	24.20	25.02*
Documentary × interpersonal	1.25	1.29
Cosmopolitan perspective[c]		
Documentary training	26.45	33.23*
Interpersonal training	16.20	22.06*
Documentary × interpersonal	0.05	0.06

[a] $df = 1,76$.

[b] Represents a composite score using the supervisory and self-ratings of performance.

[c] Perceived intensity of adjustment to a new culture and cosmopolitan perspective were analyzed using a two-way MANOVA.

* $p < .05$

the interpersonal training included direct comparisons between the home and the other culture on both general and specific cultural aspects. Information on critical incidents was conveyed through those comparisons. Although the content of the two training methods necessarily differed, I attempted to keep the information concerning South Korea consistent across all the interpersonal and documentary training conditions. Thus, the apparent success of both forms of training may be attributable to the common element, the comparative information about the critical incidents.

There are several possible explanations as to why the interpersonal style of training did not appear to reduce intensity of adjustment more than the documentary training. First, individuals whose interpersonal style is quite stable may not be easily influenced by experiential exercises. It may also be that the self-awareness gained through interpersonal training is not particularly crucial to some individuals' perceived need to adjust. In addition, it may be that the specific individuals in the present study did not need training in interactive skills. The company chose them for overseas assignments because they were seen as capable performers. Perhaps the trainees were already quite interpersonally adept, so the interactive training did not provide incremental benefits.

A second issue concerns the utility of the two methods as a complete training package. The results clearly demonstrate that, in the present context, both forms of training help prepare people for overseas assignments. It also appears that intercultural training programs should include both general and specific information presented in a way that increases individuals' awareness of their culture relative to another culture. Typically, cross-cultural training only consists of such general information on a target culture as information on religious practices, politics, and economics. The preparation of individuals in the present study who received neither documentary nor

interpersonal training was of that type. The results reported here are evidence of the superiority of presenting an individual with specific, comparative, critical incidents rather than general information alone.

Some caution concerning the effectiveness of documentary and interpersonal training is warranted. The data do not enable us to determine, for instance, how much of each form of training is best in preparing someone for an intercultural work assignment. In the present study, the managers each received 6 to 8 hours of intercultural training; it is not clear that the amount of training an individual receives is linearly related to its effects. Are 20 hours of training twice as beneficial as 10 hours? Is using several forms of training better than using one form alone? Logically, the beneficial effects of cross-cultural preparation must be subject to diminishing returns after some point. In the present study, the interpersonal training may, for instance, have been too brief to achieve its full potential. The relative discrepancy between the home and other culture and an individual's capacity to assimilate comparative information may provide boundary conditions for cross-cultural training. Likewise, it is unclear how effective these forms of intercultural training are for preparing individuals who will need to interact in a new culture at a deeper level than a work setting demands.

Further, the participants in this study were chosen on the basis of demonstrated competence in their work. It is not clear how the forms of training assessed might affect less competent managers. Although there is not necessarily a reason to anticipate that highly competent managers will benefit more from cross-cultural preparation than less competent ones, it is unclear how the present results might have differed if the managerial competence of the participants had varied.

Finally, the managers were only in South Korea for a fairly short time, three months. The effects of the new culture may not have been fully manifested; if their stay had been longer, say a year or more, perhaps full culture shock would have occurred. Future research might extend the current findings by focusing on these issues relative to training's quantity and generality.

The present study proposed that intercultural training is best achieved by making trainees aware of how their culture related to a target culture at both general and specific levels. Its principal conclusion is that documentary and interpersonal approaches are comparably effective at improving intercultural awareness.

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APPENDIX
Perceived Intensity of Adjustment Index

Participants received these instructions. "This questionnaire examines how people feel when they live in another culture or anticipate living in one. The best answer to each question is your own opinion. You are asked to estimate the average amount of readjustment you felt you needed for living in this new culture. As defined, cultural readjustment measures the intensity and length of time necessary to accommodate a cultural difference, regardless of the desirability of that difference. Your response should indicate the *amount of adjustment you had to make in comparison to the changes you had expected to make.* In other words, compared to what you expected, how much adjustment to the following items did you perceive needing to make? Please use the following scale to rate your perceived difficulty of adjustment where 1 = very little adjustment and 6 = a great deal of adjustment."

The items were: the type of food eaten; the type of clothes worn; how punctual most people are; ideas about what offends people; the language spoken (assume you have only limited ability in that language); how ambitious people are; personal cleanliness of most people; the general pace of life; the amount of privacy I would have; my own financial state; type of recreation and leisure time activities available; how parents treat children; the sense of closeness and obligation felt among family members; the amount of body contact such as touching or standing close; the subjects which should not be discussed in normal conversation; the number of people of your own race; the degree of friendliness and intimacy between unmarried men and women; how free and independent women seem to be; sleeping practices such as amount of time, time of day, and sleeping arrangement; general standard of living; ideas about friendship—the way people act and feel towards friends; the number of people of your religious faith; how formal or informal people are; your own opportunities for social contacts; the degree to which your good intentions are misunderstood by others; the number of people who live in the community; ideas about what is funny; ideas about what is sad; how much friendliness and hospitality people express; the amount of reserve people show in their relationships with others; eating practices such as amount of food, time of eating, and ways of eating; type of transportation used; the way people take care of material possessions.

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MATCHING INDIVIDUAL CAREER PLANS AND ORGANIZATIONAL CAREER MANAGEMENT

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This study questions traditional assumptions linking organizational career assistance programs with increased employee satisfaction with and commitment to organizations. A model of individual career thinking is proposed in which a match between individual and organizational career plans is the primary determinant of satisfaction and remaining with an organization. Evidence from 266 individuals supports the influence of such matching and suggests revisions of the model.

Formal organizational career management programs are increasingly a part of many firms' overall human resource strategies. Organizations often decide to adopt such programs in the belief that they will be of benefit to individual performance and development and will increase employees' commitment (Anderson, 1973; Hall & Hall, 1976; Schein, 1978; Wellbank, Hall, Morgan, & Hamner, 1978).

Recent reviews suggest, however, that such sanguine hopes may not be realized because organizational planners often ignore the effects of career assistance on individuals' decisions (Hall, Hall, & Hinton, 1978; Hall & Mansfield, 1975; Morgan, Hall, & Martier, 1979; Morrison, 1977; Rhodes & Doering, 1983; Sonnenfeld & Kotter, 1982; Yankelovich, 1974). Implementing career management systems without sufficient organizational preparation or commitment has at times resulted in ineffective or misleading programs and a backlash caused by employees' unmet expectations (Dowd & Sonnenfeld, 1984; Walker, 1978, 1980).

Managers and researchers may ignore possible negative consequences of career management programs because they make three assumptions that are often fallacious. This study clarified situations in which those three assumptions may not hold and explored a preliminary model of organizational influences on individual career planning.

ORGANIZATIONAL CAREER INTERVENTION: EXAMINING CURRENT ASSUMPTIONS

The most common rationale for organizational involvement in individual career planning is that it will reduce employees' uncertainty, help them to plan, and thus yield positive outcomes for an organization. Although it may be true that providing information helps individuals make career plans,

the suggested organizational outcomes depend on the following three assumptions:

1. Individuals expending the effort to become involved in career planning will be more likely to achieve personal career aspirations in an organization. *In short, effort leads to success.*
2. Clarification of organizational plans and individual opportunities will reduce anxiety and frustration in employees, leading to more positive attitudes toward career progress and organizations. *That is, certainty leads to satisfaction.*
3. Providing career relevant information and assistance will narrow employees' career focus and bind them more closely to an organization. *Thus, knowledge of options leads to organizational commitment.*

An examination of available decision theory suggests, however, that these propositions may be overly simplistic. First, the assumption that effort will lead to a perceived increase in career success fails to consider that increased effort may lead to higher expectations for return on the investment than previously held (Adams, 1963; Gouldner, 1960; Portwood & Miller, 1976). Instituting a career management program does not, however, increase the number of opportunities for career advancement in an organization and may actually increase competition among program participants. Also, as people's aspirations rise, fewer opportunities are likely to exist that will satisfy them. Unless an organization takes steps to either meet or adjust such aspirations, perceived career success will decline (Portwood, 1981), and employees may seek opportunities elsewhere to justify the effort they have expended.

The assumption that reducing employees' uncertainty concerning their career status in an organization will lead to greater organizational and career satisfaction has some support (Van Maanen, 1978). But individuals may not respond positively to increased certainty if additional information leads them to discover that their career plans do not match opportunities available in their current organization. Weinstein (1980) found that, in the absence of information concerning future reality, individuals tend to rate their prospects with an optimistic bias. Instituting a career management program could eliminate that bias and polarize participants. Those who perceive a match between personal and organizational goals might experience greater satisfaction, but those who perceive a mismatch might experience increasing dissatisfaction.

The last assumption, linking knowledge of organizational alternatives with organizational commitment, also has only narrow support. Individuals tend to make use of readily available and apparent solutions. They may even shape their own aspirations in terms of the alternatives that organizations present (Elbing, 1970), but only until growing feelings of disequilibrium justify the cost in time and effort of seeking out less obvious alternatives (London, 1983). As dissatisfaction increases, increased activity aimed at relieving that disequilibrium is likely to occur. If career programs reveal a good match between individual and organizational plans, they may channel such activity toward organizationally desirable solutions. If the solutions offered by an organization do not match those an employee values, that

individual may search for alternative career paths external to the current employer.

Career management programs therefore may or may not generate positive outcomes for organizations and their employees. If programs raise aspirations to unrealistic levels or make employees certain that their personal career plans do not match those of their organization, knowledge of organizational career opportunities may force them away from an organization rather than binding them to it.

Managers need to understand how individual planning, organizational career information, and perceived matches between individual and organizational career plans combine to shape and energize employees' career attitudes and behaviors. We addressed those issues by proposing and exploring a model of individual career planning that incorporates the three critical assumptions we have described.

A TENTATIVE MODEL OF ORGANIZATIONAL INFLUENCES ON INDIVIDUAL CAREER PLANNING

From an organizational perspective, perhaps the most important career decision people make is whether to stay in a firm. To analyze what influences individuals to stay, we adapted a general decision making framework proposed by March and Simon to explain an individual's "decision to participate" in a particular organization (1958: 83).

March and Simon suggested that feelings of disequilibrium arising out of their current situation arouse people to seek clarification, search for alternatives, and make decisions. Such feelings are often the result of organizational actions that provide information concerning a work context and their place in it (March & Simon, 1958: 115–117). When faced with uncertainty, individuals seek clarification and then make choices that are based on their perception of how well a newly perceived organizational reality matches their personal needs and self-image (March & Simon, 1958: 57, 99). Failure to perceive an acceptable match causes individuals to begin a search for more palatable alternatives either inside or outside an organization.

Applying March and Simon's framework to individual career decisions yields the model depicted in Figure 1. In the model, organizational characteristics influence career-planning activities and the possibility that career plans made by employers for individual employees will match their own individual career plans. Individuals' characteristics also influence whether they will take advantage of such activities and whether a match will exist. If individuals perceive a match between the two sets of career plans, satisfaction and commitment will follow; if not, a search for other alternatives will result.

Examining the model in detail can clarify the justification for specific relationships. Elements of the model are labeled x_n. We hypothesized a set of specific causal relationships, indicated by p_{nm}, where n is the subscript of the effect variable and m is the subscript of the causal variable.

FIGURE 1
Initial Hypothesized Model of Organizational Influences on Individual Career Beliefs and Attitudes
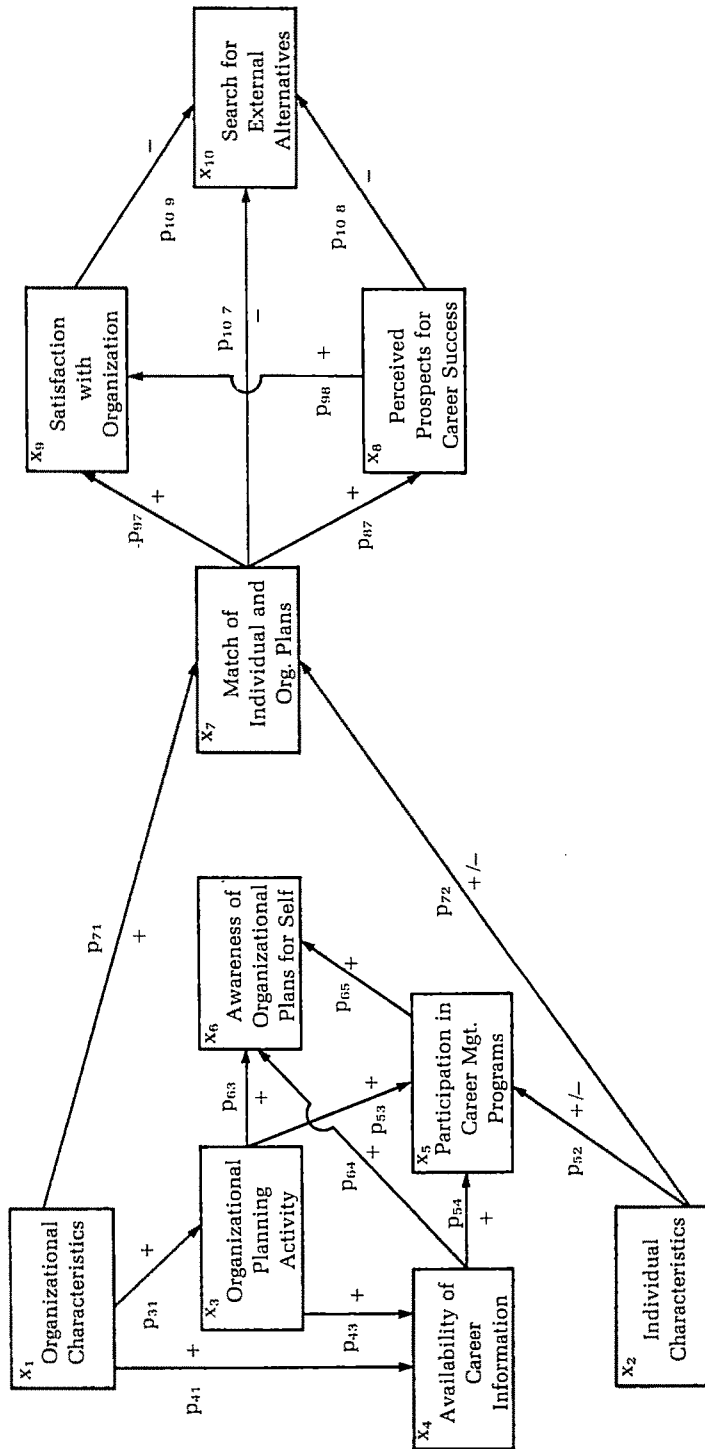
One key organizational behavior that could create career-related uncertainty and feelings of personal disequilibrium is organizational planning activity. The primary aim of planning in large organizations is to specify and narrow the focus of organizational strategies. The resulting plans can influence, and sometimes limit, an individual's future prospects in a firm. Organizational characteristics (x_1) such as size, growth, and differentiation may increase organizational planning activity (x_3), as designated by the path p_{31}, and may increase availability of career information (x_4), as designated by the path p_{41}. Large, faster-growing, sophisticated organizations have extensive resources with which to drive planning systems. They also have a need to plan future human resource allocations and to keep employees in tune with where a company is going (Walker, 1980).

Likewise, organizations that encourage planning in general are more likely to see a need for human resource planning and to have the plans and resources needed to increase the availability of career information (x_4) via p_{43}. Planful organizations are also more likely to encourage employees to be planful themselves, which would include encouraging participation in career management programs (x_5), as indicated by p_{53}. Availability of career information (x_4) should stimulate individuals to protect their own interests by seeking further clarification of their career options through such actions as participation in career management programs, as the path designated p_{54} indicates.

At the same time, individual characteristics (x_2) can affect the perceived usefulness and desirability of seeking specific career information and thus an individual's interest in participation in career management programs, indicated by the path p_{52}. Employees who are uncertain about career plans or career opportunities—those who are young or who perceive barriers due to discrimination or conflicts between work and family, for example—may be stimulated to seek information to reduce their uncertainty.

We expect individuals' awareness of organizational plans for them (x_6) to be an important outcome of their participation in career management programs (x_5), as designated by path p_{65}. In the model, we also propose a positive effect of organizational planning activity (x_3) and availablility of career information (x_4) on such awareness of organizational plans; relevant paths are p_{63} and p_{64}. We expect planful organizations that provide career services to be likely to actually have career plans for individuals to perceive. If career programs are successful in meeting their oft-stated goals, participation in them should clarify for people whether organizational career plans for them exist (Hall, 1976). Also, it may be possible, particularly in planful organizations, for individuals to get information about organizational plans for their careers without participating in formal career assistance programs.

Traditional thinking would propose a relationship between participation in career management programs (x_5) and outcome variables like satisfaction with an organization (x_9) and perceived prospects for career success (x_8). However, this model does not contain such direct relationships because we

hypothesized that such outcomes depend on the kind of information individuals receive and whether they perceive a match.

Awareness of organizational plans for oneself (x_6) may indeed relieve disequilibrium due to uncertainty. However, a new disequilibrium based on the perceived match (or mismatch) between individual and organizational career plans (x_7) may replace the old disequilibrium. We hypothesized no relationship between those variables because awareness does not in itself cause a match to occur automatically.

Individuals who have no career plan may acquiesce to an organization's plan, but those who already have a career plan are not likely to change it to match an organizational plan simply because they become aware of the latter. According to March and Simon (1958), they would be more likely to act to relieve disequilibrium by seeking external alternatives.

Organizational characteristics (x_1) and individual characteristics (x_2), both of which limit or expand the range of alternatives available for a match, influence the likelihood that individuals will perceive a match between their career plans and organizational plans. Relevant paths shown in the model are p_{71} and p_{72}, respectively. Previous research has shown that such factors as organizational size, growth, and degree of differentiation increase opportunities for individual mobility and career flexibility within a firm, so those characteristics may increase the possibility of a perceived career match (Stumpf & Hartman, 1984). Much of the literature examining person-organization fit has looked at static matches between individuals and their current jobs rather than their careers. However, some previous investigators have associated individual characteristics with variations in perceived matches between individuals and jobs (cf. Hall & Mansfield, 1975; Porter & Steers, 1973; Rapoport & Rapoport, 1976). Thus, we expected career-family conflicts or age- or gender-based discrimination to reduce available options and thus the likelihood of perceived match.[1]

If a perceived match (x_7) of career plans exists, an individual might perceive favorable prospects for career success (x_8), as reflected by p_{87}, and also exhibit high satisfaction with an organization (x_9), indicated by p_{97} and p_{98}; if an individual perceives *no* match, dissatisfaction is likely. In that case, the most readily available course of action to reduce disequilibrium would be a search for external alternatives (x_{10}), as indicated by $p_{10\ 7}$, $p_{10\ 8}$, and $p_{10\ 9}$ (cf. Bluedorn, 1982; Mobley, Horner, & Hollingsworth, 1978). Once identified, external alternatives might provide an opportunity to match personal and organizational plans and a way to reduce disequilibrium, thus leading people to leave their organizations.

Our model suggests that in spite of—and indeed, in some cases because of—organizational career management programs, some employees may seek and pursue career options outside their current organizations. Most career management programs certainly do not intend that consequence.

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[1] Individuals faced with persistent barriers may, however, abandon unachievable goals or choose organizations where such constraints are minimized, thus weakening the effect.

METHODS

Overview of Research Procedures

Preliminary data for exploring the extent of empirical support for the relationships in the model were collected through 300 written questionnaires distributed to participants in continuing education courses in business management at Temple University. We received completed questionnaires from 266 currently employed individuals, a response rate of 81.8 percent. Where possible, we composed multiitem scales to measure constructs in the model. Each scale was based on a factor analysis in which items loading over .45 on a single factor were summed. The Appendix gives all items and response categories for the multiitem measures. Items worded negatively in the questionnaire were reverse-scored for analysis and reporting.

Respondents

Table 1 gives the demographic characteristics of the respondents, who were primarily young, white managers and professionals. They had worked for their present employers an average of four years and expected to remain an average of 7.2 years.

TABLE 1
Characteristics of Respondents and Their Organizations

Characteristics	Percentage[a]	Characteristics	Percentage[a]
Individual		Annual Salary	
Gender		Under $20,000	33
Women	48	$21–30,000	39
Men	52	$31–40,000	21
Age		$41,000 +	7
21–30	67	**Organizational**	
31–40	27	Type of business	
41–50	6	Service	48
Religion		Manufacturing	29
Protestant	31	Finance/insurance	17
Catholic	47	Transportation/utilities	4
Jewish	10	Wholesale/retail	4
Other	12	Number of employees in	
Married	45	organization	
Parents	34	Under 250	31
Occupation		251–1,000	23
Managerial & self-employed	40	1,001–10,000	28
Professional/technical	33	10,000 +	18
Other	27	Organizational change	
Organizational tenure		10% + decline	21
Less than 2 years	44	1–9% decline	23
3–4 years	27	Stable	27
5 or more years	29	1–9% growth	14
		10% + growth	15

[a] Figures represent percentages of total number of respondents: $N = 266$.

The organizations employing them were fairly evenly divided between those having more than 1,000 employees and those having fewer. Almost half the organizations were declining in size. The predominance of low-growth organizations was probably a function of the economic difficulties that characterized the time of data collection (1984), general economic decline in the urban northeastern United States, and a possible selection bias related to individuals choosing to obtain further education.

Since managers in the study group were seeking further education, they were, perhaps, more motivated than the general population of managers. Because of their education and their early career stage, it would be inappropriate to generalize from them to all managers in all settings. In spite of this limitation, however, the data are sufficient to begin to explore the issues we have raised and to suggest potentially fruitful areas for future research.

Measurement of Variables

The exogenous constructs of individual characteristics and organizational characteristics were measured by responses to single items requesting demographic information. Individual characteristics originally examined included gender, age, race, marital status, parental status, number of subordinates, and organizational tenure. When we found that race, parental status, and number of subordinates appeared unrelated to any other variables in the model and that age was highly correlated with organizational tenure, we omitted those variables to simplify expression of the model.

The organizational characteristics we chose to measure were size, growth, and differentiation. Table 1 indicates response categories as well as presenting summarized data. As differentiation was not related to any other variables, we omitted it from further analysis.

Although many intermediate individual and organizational characteristics may influence the endogenous variables—culture, or work-family interactions, for example—we did not include them here. The primary focus of the model is the chain of relationships between organizational planning, career programs, the perceived match of individual and organizational career plans, and satisfaction and commitment to an employing organization.

Two organizational process variables are included in the model because of their specific relationship to career planning. First, four items assessing the planning characteristics of an organization measured respondents' perceptions of their organizations' planning. A second process variable, availability of career information, was assessed with an item asking respondents whether any career management activities existed in their organization. We dummy-coded yes/no responses.

The question of whether individual perceptions were the appropriate level of measurement for organizational process characteristics may arise. We suggest that since each individual represented a single and, usually, a unique organization, aggregation problems caused by using an average score of many individuals to represent one organization are not relevant. In this

study, respondents took the role of key informants and expressed perceptions of information that might stir them to action.

Participation in career management programs was operationally defined by how many of 11 different types of career planning programs an individual had used. Unfortunately, the size of the group prevented use of each type of program separately in model testing. Individuals' awareness of organizational career plans for them was measured by the response to "My company has a plan for my future." The 5-point response format ranged from very unlikely to very likely.

The central construct explored in this study was the degree of perceived match between individual and organizational career plans. Seven items asked respondents how likely it was that their goals, strategies, and time tables matched their organizations' or could be fulfilled in their organizations. The sum of two items asking repondents to rate (1) how satisfied they were with their career progress and (2) the overall potential for their attaining their career goals served as a measure of perceived prospects for career success. The sum of eight items derived from Schein's (1978) work on career anchors measured organizational satisfaction. Finally, a search for external alternatives, conceptualized as loss of commitment to a current organization, was measured as the sum of three items.

Data Analysis

Path analysis of the model's structural equations was conducted with ordinary least squares estimation of the model's parameters. The analysis omitted individuals with any missing data. Use of path analysis requires that several assumptions be met. First are the usual assumptions of multiple regression: independence, linearity and additivity of relationships, and homoscedasticity and normality of errors. An examination of residuals, number of respondents, and research design indicated that these assumptions were likely to be met. Another assumption, that the disturbance factor be uncorrelated with the exogenous variables, implies that (1) a model is recursive and at equilibrium, (2) exogenous variables are measured without error, and (3) there are no unmeasured common causes of exogenous variables. The exogenous variables of individual and organizational characteristics used in this model, such as gender, marital status, organizational tenure, organizational size, and organizational growth can be measured with a reasonable degree of reliability and validity. They are also unlikely to have a third cause in common with each other or the endogenous variables. The correlation matrix (Table 2) indicates few large significant relationships among exogenous variables.

The assumption that a model is recursive and models a system at equilibrium can be addressed in several ways. The direction of causality of some of the model's relationships rests on logical assumptions. For instance, perceptions of planning and matching are unlikely to affect an organization's size or an individual's marital status. The directionality of other relationships rests on March and Simon's (1958) theoretical work. Examples are the

TABLE 2
Means, Standard Deviations, and Intercorrelations of Variables[a]

	Means	s.d.	1	2	3	4	5	6	7	8	9	10	11	12
1. Organizational growth	3.81	1.57												
2. Organizational size	3.87	1.79	-195											
3. Organizational tenure	3.94	3.83	-246	193										
4. Gender	1.50	0.50	-106	-053	028									
5. Marital status	1.50	0.50	-064	-089	096	163								
6. Planning activity	12.66	3.84	085	075	054	-034	005							
7. Availability of career information	1.50	0.50	-031	430	128	-125	052	240						
8. Participation in career management programs	0.93	1.71	-096	254	305	-205	023	305	595					
9. Awareness of organizational plans for self	2.65	1.45	166	028	039	020	021	510	266	284				
10. Match of individual and organizational plans	18.49	7.58	134	076	060	015	164	489	227	236	671			
11. Perceived prospects for career success	7.46	1.64	-059	038	059	107	055	231	047	024	353	496		
12. Satisfaction with organization	34.41	7.42	088	086	042	-036	198	481	255	215	619	792	569	
13. Search for alternatives	10.29	3.66	-161	-030	-037	-046	-189	-472	-160	-111	-508	-756	-513	-708

[a] Correlation coefficients greater than .11 are significant at $p < .05$; decimal points omitted.

proposals that information about an organization stimulates participation in career programs and that information about matching and mismatching plans leads to either satisfaction or a search for external alternatives. Although the assumptions for path analysis can never be perfectly met, there are reasonable grounds for conducting the analysis.

Eight structural equations, one for each dependent or endogenous variable in the model, portray the theoretical relationships shown in Figure 1. The model involves several relationships of the $x_1 \rightarrow x_2 \rightarrow x_3$ variety and is thus overidentified. Scholars have disagreed on appropriate analytic techniques in this situation. Goldberger (1970) advocated regressing x_1 on x_2 and assuming a null direct effect of x_1 on x_3; however, Kenny (1979) argued that it is preferable to regress x_1 on both x_2 and x_3 and to expect the path from x_1 to x_3 to be nonsignificant. We chose Kenny's alternative, including all variables with a prior level of causality in the estimation of each equation.

That choice was particularly appropriate in this exploratory analysis because it allowed for discovery of unexpected relationships. For example, we hypothesized that organizational characteristics (x_1) affect organizational planning activity (x_3), which in turn affects individuals' awareness of organizational plans for their careers (x_6). We included organizational characteristics in both the equation for organizational planning activity and the equation for awareness of organizational plans. Our expectation was that the coefficients for organizational characteristics would not be significant in the equation for individuals' awareness of organizational plans for their careers. If those coefficients were significant, the proposed model would need to be reconsidered.

RESULTS

The first portion of the model consists of factors that contribute to individuals' awareness of organizational plans for their careers. As expected, large organizations did have extensive career information available [p_{41}], and size was positively related to organizational planning activity [p_{31}]. However, examination of the path coefficients depicted in Table 3 indicates that planful organizations did not make more career information available to employees [p_{43}]. Both organizational planning and availability of career information

TABLE 3
Organizational Influences on Individual Career Beliefs and Attitudes

Effects on	Sizes of Causal Effects			Noncausal Covariation[a]
	Direct	Indirect	Total	
x_3 **Organizational planning activity**				
p_{31} Organizational characteristics				
Size	.147*	—	.147	(.072)
Growth	.078	—	.078	.007

TABLE 3 (continued)

Effects on	Sizes of Causal Effects			Noncausal Covariation[a]
	Direct	Indirect	Total	
x_4 **Availability of career information**				
p_{41} Organizational characteristics				
Size	.138*	—	.138	.292
Growth	.043	—	.043	(.074)
Individual characteristics				
Gender	−.095	—	−.095	.030
Tenure	.042	—	.042	.086
Marital status	.052	—	.052	.000
p_{43} Organizational planning activity	.094	—	.094	.146
x_5 **Participation in career management programs**				
p_{51} Organizational characteristics				
Size	−.014	.083	.069	.185
Growth	.055	—	.055	(.151)
p_{52} Individual characteristics				
Gender	−.134*	—	−.134	.071
Tenure	.218**	—	.218	.087
Marital status	−.044	—	−.044	.067
p_{53} Organizational planning activity	.118**	—	.118	.116
p_{54} Availability of career information	.481**	—	.481	.114
x_6 **Awareness of organizational plans for self**				
p_{61} Organizational characteristics				
Size	−.061	.048	−.013	.041
Growth	.200**	—	.200	(.034)
Individual characteristics				
Gender	.043	—	.043	(.023)
Tenure	−.028	—	−.028	.067
Marital status	.082	—	.082	(.061)
p_{63} Organizational planning activity	.325**	—	.325	.185
p_{64} Availability of career information	.103	—	.103	.163
p_{65} Participation in career management programs	.105	—	.105	.179
x_7 **Match of individual and organizational plans**				
p_{71} Organizational characteristics				
Size	.078	−.007	.071	.005
Growth	.068	.103	.171	(.037)
p_{72} Individual characteristics				
Gender	.036	—	.036	(.021)
Tenure	.021	—	.021	.039
Marital status	.180**	—	.180	.016
Organizational planning activity	.172*	.167	.339	.150
Availability of career information	−.023	—	−.023	.204
Participation in career management programs	.041	—	.041	.195
Awareness of organizational plans for self	.514**	—	.514	.157
x_8 **Perceived prospects for career success**				
Organizational characteristics				
Size	−.013	.032	.019	.019
Growth	−.153	.078	−.075	.015

TABLE 3 (continued)

Effects on	Sizes of Causal Effects			Noncausal Covariation[a]
	Direct	Indirect	Total	
Individual characteristics				
Gender	.049	—	.049	.058
Tenure	.034	—	.034	.025
Marital status	−.027	.082	.055	(.001)
Organizational planning activity	.016	.154	.170	.061
Availability of career information	−.016	—	−.016	.063
Participation in career management				
programs	−.119	—	−.119	.143
Awareness of organizational plans for self	.117	.053	.170	.183
p_{87} Match of individual and organizational				
career plans	.455**	—	.455	.041
x_9 **Organizational satisfaction**				
Organizational characteristics				
Size	.016	.041	.057	.029
Growth	−.000	.068	.068	.020
Individual characteristics				
Gender	−.072	—	−.072	.036
Tenure	−.037	—	−.037	.079
Marital status	.115*	.106	.221	(.023)
Organizational planning activity	.110	.209	.319	.162
Availability of career information	.064	—	.064	.190
Participation in career management				
programs	−.020	—	−.020	.195
Awareness of organizational plans for self	.117	.306	.423	.196
p_{97} Match of individual and organizational				
career plans	.511**	.115	.626	.166
p_{98} Perceived prospects for career success	.252**	—	.252	.317
x_{10} **Search for external alternatives**				
Organizational characteristics				
Size	.011	−.049	−.038	(.008)
Growth	−.089	−.087	−.176	(.015)
Individual characteristics				
Gender	−.021	—	−.021	.035
Tenure	−.024	—	−.024	.013
Marital status	−.060	−.141	−.201	(.012)
Organizational planning activity	−.148*	−.256	−.404	.068
Availability of career information	−.028	—	−.028	.132
Participation in career management				
programs	.083	—	.083	.194
Awareness of organizational plans for self	.075	.363	−.288	.220
$p_{10\,7}$ Match of individual and organizational				
career plans	−.493**	−.191	−.684	.072
$p_{10\,8}$ Perceived prospects for career success	−.146*	−.037	−.183	.330
$p_{10\,9}$ Organizational satisfaction	−.200*	—	−.200	.507

[a] Noncausal covariation is obtained by subtracting the total causal effect from the correlation between the dependent and independent variables. Values in parentheses indicate that the causal effect is larger than the correlation.

    * $p < .05$
    ** $p < .01$

had a significant, direct, and positive effect on participation in career management programs [p$_{53}$] [p$_{54}$].

It was expected that individuals who were just beginning their careers or who anticipated difficulties because of discrimination or complex work-family planning needs might also be especially likely to use career management programs [p$_{52}$]. We found that women and those with long organizational tenure had participated in more programs than other employees. Although we would expect individuals with long tenure to be settled in their career paths, the high number of opportunities to participate in programs they would have had over the years probably accounts for the finding.

Contrary to another hypothesis, participation in career management programs did not have a significant effect on individuals' awareness of organizational plans for their careers [p$_{65}$]. As we expected, however, and contrary to traditional assumptions, participation did not have an effect on the match between individual and organizational plans, perceived prospects for career success, organizational satisfaction, and searching for a job outside an organization. Organizational planning did have an effect on individuals' awareness of an organization's having plans for their careers [p$_{63}$], however, as did organizational growth. These findings suggest that people may find out about an organization's plans for their future more through general observation than through participation in organized career programs.

Simple awareness that an organization has a plan for one's career is not enough to create a match. The model suggests that the key factor is whether or not increased knowledge reveals perceptions of a match between individual and organizational plans. We proposed that a perceived match would be more likely if an organization offers many career opportunities by virtue of its size or rate of growth [p$_{71}$]. Neither organizational growth nor size had a direct effect on perceived match, but growth did have a substantial, indirect, positive effect. Employees were somewhat unlikely to perceive large organizations as growing at the time of the survey, however, so lack of growth may have counterbalanced the greater number of career opportunities we would expect to be available in a large organization. Also, growing organizations may not have been large enough to offer a reasonable variety of career alternatives.

Several individual characteristics were expected to influence the possibility that a match would be perceived [p$_{72}$]. Gender and organizational tenure were not related to perceived matches, but marital status was, with married individuals more likely to perceive a match. We expected that marriage might have a negative effect because the variety of alternatives married people found acceptable might be constrained by dual career concerns. Despite the unexpected finding, it may be premature to conclude that this portion of the model has no empirical support. These young, well-educated employees were a homogeneous group unlikely to have experienced much restriction of opportunity for matching plans so early in their careers. They may also have selected organizations that they did not expect would present

conflicts. The finding that married individuals were more satisfied with their organizations overall supports that explanation.

It is central to our critique of common assumptions to note that, as hypothesized, neither availability of career information nor participation in career management activities were related to match of plans or to the outcome variables. Contrary to our hypotheses, however, individuals' awareness of organizational plans for their careers was strongly related to perceived match.

Several additional findings support the hypothesized model. Individuals who perceived a match between their own and their employer's plans for their careers perceived more positive opportunities for career progress $[p_{87}]$ and higher satisfaction with their organizations $[p_{97}]$ than did other individuals, and they were less likely to be searching for external alternatives $[p_{10\ 7}]$. Those who believed they had good prospects for career success were more satisfied with their organizations $[p_{98}]$ and less likely to search for external alternatives $[p_{10\ 8}]$, $[p_{10\ 9}]$.

Three other points concerning Table 3 deserve attention. First, organizational planning and individuals' awareness of organizational plans for them have strong indirect effects on the outcome variables and merit future research investigation. Second, perceived prospects for career success and the career management and career information variables have large proportions of unexplained variance, which suggests that, not surprisingly, those variables are likely to have causes not included in the model. The covariation that remained between participation in career management programs, perceived match, and organizational satisfaction when all other model variables were included also merits further attention.

Third, path analysis, unlike simultaneous equation procedures such as LISREL, does not provide a simple test of a model's goodness of fit. Because five unhypothesized relationships emerged and four hypothesized relationships were not confirmed, and because in a substantial number of relationships the unexplained variance exceeded .10, we cannot claim that the total model fits the data. Examining the pattern of paths that are empirically supported indicates that several differences between those paths and the hypothesized pattern are related to individual and organizational characteristics. That pattern suggests that the model may need to be modified with regard to several constructs and also that other measures and other respondents should be explored to determine if the differences represent a theoretical issue or a measurement problem. The other substantial discrepancy between the hypothesized model and the empirical findings is the absence of a relationship between organizational career planning activities and awareness of organizational career plans for individuals. The findings, which suggest that career activities may not have the effects many expect of them, may have serious implications for practitioners if future studies substantiate them.

DISCUSSION

The preliminary empirical evidence we have reported provides general support for many of the key relationships contained in the model. The data suggest that the extent of perceived matching between individual and organizational career plans is related to individuals' attitudes concerning their careers. Such matches seem to have an influence on satisfaction and desires to leave or remain with an organization, whereas participation in formal career management programs does not appear to have such an effect. According to our analyses, both perceptions of organizational planning activity and the perceived availability of career information increase participation in company-sponsored career assistance programs, and perceptions of organizational planning activity also increase employees' awareness of organizational plans for their careers. If those plans do not match, dissatisfaction and a shift of focus to a search for alternatives outside of a current organization result.

Although support for many hypothesized relationships emerged, the empirical evidence suggests that some modifications in the original model are advisable. In the modified model (Figure 2), perceptions of organizational planning activities have a strong influence on individual career attitudes. In addition to links proposed in the original model, significant organizational planning activity is also associated with individuals perceiving a match between their own and their organization's plans for their future and is negatively related to a search for external alternatives.

Since the data represent a single point in time, earlier events that could influence the model are not accounted for. It is possible that organizations with well-developed planning procedures are better able to identify the types of individuals they need and to articulate what they have to offer. Individuals would, therefore, be more likely to match organizational opportunities from the beginning, either because organizational selection is highly accurate (Walker, 1980) or because realistic job previews allow potentially mismatched individuals to select themselves out (Wanous, 1973).

Much the same explanation might exist for the unexpected relationship we found between individuals' awareness of organizational plans for their careers and perceptions of match. If we assume that individuals may have known about such plans for some time, it is possible that those who have perceived a mismatch have already changed jobs. That finding could be seen as consistent with the model, given our original contention that knowledge of organizational plans is likely to cause action, but not necessarily in the desired or expected direction, and given the finding that perceptions of a mismatch lead to a desire to exit.

Another possibility is that knowing an organization's plans for their future may have led individuals whose own plans were vague or malleable to consider an organization's plan and adopt it as their own, resulting in a later perception that the plans "match."

One of the most important findings is the lack of a significant link between individuals' participation in organizational career assistance activi-

FIGURE 2

Modified Empirical Model of Organizational Influences on Individual Career Beliefs and Attitudes[a]
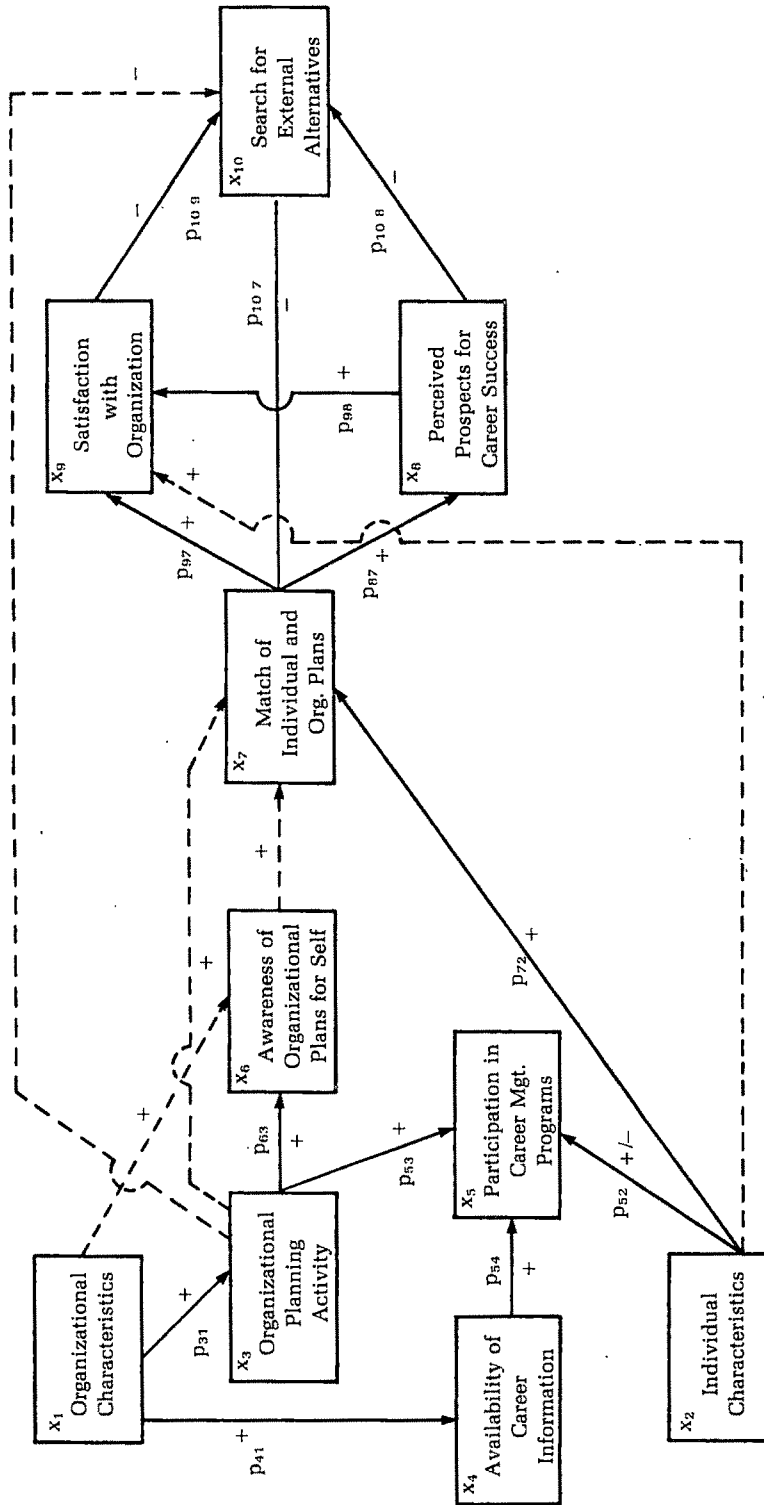
[a] Solid lines indicate that effects were hypothesized and substantiated empirically; dotted lines, effects not hypothesized but found empirically.

ties and their awareness of the existence of organizational career plans for themselves. The initial model did not assume that career management programs would lead to a match but did assume that they would at least give participants information about an organization's possible plans for them and the opportunities available to them. The sponsors of many career management programs assert that participation will clarify career opportunities an individual might expect to find. Of course, it could be that the career planning programs respondents had participated in did not have such an objective or were poorly executed. However, since more than 200 organizations were represented in the study, and since clarification of opportunities is a common expectation for career programs, we might counsel caution in assuming that this outcome will usually occur. Lack of support for the relationship strengthens the argument that simply mounting a career assistance program does not guarantee the desired positive results of increasing satisfaction for individuals or increasing commitment and retention for an organization.

Another major area in which the empirical results are not as proposed in the original model concerns individual and organizational characteristics. The mixed results concerning the effects of selected individual variables on perceptions of a match in individual and organizational career plans may be due to the relative homogeneity and youth of the sample or to adjustment of career aspirations to organizational reality. That explanation suggests a need to extend the investigation to a broader range of employees. In particular, future studies need to include job applicants, older employees, and those who have not chosen to pursue further education.

No organizational characteristics were found that related directly to the degree of career plan match. Since the large organizations represented were also declining in size, the measures of organizational structure may have been too general to reveal possible influences on perceived opportunities for career match or, as we suggest in the modified model, the effect may be entirely indirect. Organizational growth did have an influence on awareness of plans. The most logical explanation is that individuals may find it easier to identify opportunities in a growing organization.

Future Research

Future work on this proposed model could encompass many issues. First, since having a good match does seem to be an important predictor of an employee's commitment to pursuing a career with the present employer, additional effort to clarify and detail specific predictors and outcomes of match seems justified. Further research enlarging the data base and refining the measures of organizational characteristics and individual characteristics to include multiple items, multiple sources, and more specific attributes is necessary. Such research would help determine whether the proposed relationships can ultimately be supported or need to be modified. Many organizational and individual characteristics warrant further exploration. The extent to which individuals perform well, are challenged, and are adequately

rewarded may influence the extent of their planning as well as their interest in finding out about organizational plans for their future. Precise measurement of those variables, as well as development of a more complete, perhaps multidimensional, measure of awareness of organizational plans is needed. Also, studies that focus on the selection process and its influence on match may help to clarify the extent to which (1) organizations can modify those relationships, and (2) individuals choose only organizations in which a career plan match is likely.

On the other end of the model, the network of relationships between match, perceived career success, organizational satisfaction, search for external alternatives, and actually leaving an organization needs to be more carefully examined. If investigators engaged in research and theory on turnover begin to include measures of career planning match in their work, it may be possible to clarify the extent to which feelings of dissatisfaction related to mismatched career plans—as distinct from dissatisfaction with a particular job—actually lead to employees' leaving an organization. Such clarification would require future studies to obtain access to a broad sample of organizational records of career programs, evaluations, and turnover, as well as highly specific measurement of employees' plans, attitudes, and actions. As a corollary to that point, it would obviously be of great advantage to pursue these ideas in a longitudinal study. Our cross-sectional research design and reliance on self-report and single-item attitudinal, rather than behavioral, measures limit the generalizability of this study's conclusions. Our methods may have resulted in respondent justification or cognitive consistency effects that make relationships appear stronger than they really are.

Implications for Practice

From a practical point of view, support for the concept of perceived career match as a determinant of individual career-strategy outcomes raises further questions concerning the one-sided assumptions career management advocates make. The findings of this study suggest that personal involvement in a career management program and access to career information are not related to increased satisfaction and commitment. If organizations do not seek to match opportunities to employees' aspirations, many employees are likely to be alienated and may leave. Systems that help individuals clarify their own career goals or suggest organizational career paths but do not confront the possibility of an individual-organizational mismatch may simply be creating a problem of high turnover. The problem can, however, actually become an advantage if the employees who perceive a mismatch and leave an organization are the ones the firm would rather see go. The real risk, then, is that inaccurate or ambiguous information provided by an organization might lead valued individuals to misperceive a situation and seek career options elsewhere.

Anticipating that both matches and mismatches can occur could encourage managers to design flexibility into their human resource plans. Employee and employer might then negotiate a mutually acceptable outcome.

If organizations address employees' expectations before individuals become fully invested in a particular career path (Wanous, 1973), individuals may modify their expectations and they might then more fully explore organizational alternatives. But if potential differences are ignored, individuals and organizations may develop mutually incompatible plans, and undesirable departures may result.

Although the findings reported here help to focus attention on a key problem for career managers, finding a solution may be far from easy. In fact, several factors are likely to increase the difficulties managers face in maintaining a mutually acceptable match for needed employees. Driver (1982) suggested that members of our society are undergoing a fundamental change in how they approach career planning. He concluded that members of today's workforce demonstrate an increasing willingness to change jobs and even careers if they perceive barriers to attainment of personal goals. His statement suggests that employees will be less patient and perservering in the future and will put pressure on organizations to deliver opportunities earlier in their careers.

A second threat is the movement of the baby-boom generation to what Schein (1978) termed the midcareer crisis point. The sheer size of the group and the immediacy of its demands are likely to severely strain career management systems and opportunity structures. Organizations will have to address difficult decisions as to what to tell people reaching that plateau on a much larger scale than ever before. High expectations among baby boomers raise the potential for widespread mismatches and consequent disaffection. If organizations truly cannot match their employees' career plans, they may have to seriously consider finding career path alternatives for them, or many valued employees may begin to search for other jobs. Organizations may want to consider providing flexible hours, changing job designs to offer new or more varied rewards, or broadening choices of career paths organization-wide. Negotiations between individuals and their employers over exchanging upward mobility for increasing responsibility, productivity, or employee development may be advisable if organizations are to retain valued employees.

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APPENDIX

Several of the constructs in the model were measured with more than one questionnaire item. We then constituted single indicators by summing all relevant items that loaded over .45 on only one factor in a factor analysis of relevant items. Items, response categories, and coefficients of internal reliability (α) follow.

Organizational Planning Activity

The items read: "The attitude toward planning in this company is very favorable," "My supervisor's attitude toward planning is very favorable," "Planning is a major activity in this company," and "The planning done in this company is very effective." Response categories ranged from 1 = strongly disagree to 5 = strongly agree (α = .877).

Participation in Career Management Programs

The alternatives were job posting, career path information provided by the organization, annual performance review, fast track program, information on career planning provided by the organization, individual career counseling, career testing, coaching or mentoring, assessment centers, and career planning workshops. For each alternative, respondents could choose "not available in my company," "available to others but not to me," "available to me but I have not used it," or "available to me and I have used it." The measure was a sum of the number of times a respondent selected the last possibility.

Match of Individual and Organizational Plans

Three items asked respondents to rate on a 5-point scale from 1 = very unlikely to 5 = very likely whether their individual career goals matched their company's goals for their future, whether their career timetable matched their company's timetable for them, and whether their career strategy matched their company's strategy for them. An additional four items asked on a 5-point agree–disagree scale whether they could meet their career goals, career timetable, and career strategy inside their company and whether they could meet their family and work career plans inside their company (α = .949).

Satisfaction with Organization

Respondents rated their satisfaction with their organization, their job, and their opportunities for promotion, pay, acquiring technical knowledge, status, creativity, and autonomy. The items measuring satisfaction with peers and with security did not load on the same factor as the organizational satisfaction item and were omitted from this analysis. Response categories were 1 = very dissatisfied to 5 = very satisfied (α = .889).

Search for External Alternatives

"I am or will be looking for a job in another organization," "I would accept a job in another organization, if offered," and "There are other organizations for which I would rather work" were rated on a 5-point strongly agree–strongly disagree scale (α = .853).

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VOLUNTARILY LEAVING AN ORGANIZATION: AN EMPIRICAL INVESTIGATION OF STEERS AND MOWDAY'S MODEL OF TURNOVER

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This study tested propositions derived from Steers and Mowday's (1981) model. A group of 445 employees of a financial institution responded to a mailed survey. Through access to their personnel records, we obtained data on their job performance and their subsequently staying with or leaving the organization. Results indicated that met expectations, job values, job attitudes, intention to leave the organization, and actual leaving were related to many, though not all, theorized antecedent variables.

In recent years, the major advances in the literature on employees' leaving organizations have involved the development of several conceptual models that attempt to explain the process through which someone quits (Mobley, 1977; Mobley, Griffeth, Hand, & Meglino, 1979; Price, 1977; Steers & Mowday, 1981). These models seek to identify key variables and to suggest the relationships among those variables in the leaving process. Unfortunately, empirical research, which stimulated initial theoretical development, has not kept pace in the direct testing of the models. Among the major models, only Mobley's and, to a lesser extent, Price's have received systematic research attention. The two other major models have yet to be comprehensively tested. The lack of empirical testing for Steers and Mowday's (1981) model is especially striking, perhaps because it is the most recent.

Like their predecessors, Steers and Mowday offered a conceptual framework that summarizes much empirical research. Their model also includes several variables not found in earlier models and thus suggests new areas for empirical research. The purpose of the present study was to provide the first relatively comprehensive test of Steers and Mowday's (1981) model. Rather than examine a few selected relationships, as other studies have done, we examined as much of the model as possible.

THE STEERS AND MOWDAY MODEL

Figure 1 is a pictorial representation of Steers and Mowday's (1981) model. They proposed that the following sequence of variables leads to an employee's staying with or leaving an organization: (1) job expectations, conceptualized as met expectations (1981: 241–244), and values influence an individual's affective responses to a job; (2) affective responses affect desire and intention to stay or leave, with the choice depending on a variety of nonwork influences like spouse's job and time left for family; and (3) an intention to leave an organization leads to actual leaving. The model's designers specifically noted that the sequence may differ across individuals. For some, an intention to leave may relate rather directly to leaving. For others, that intention may initiate search behavior leading to a more attractive job alternative. Such individuals would actually leave an organization only after finding another job.

Steers and Mowday discussed several affective responses to job and organization, including job satisfaction, job involvement, and organizational commitment. They considered the most direct influences on affective responses to be the interactions of (1) job expectations and values; (2) organizational characteristics and experiences, conceptualized as an individual's "experienced organizational reality," (1981: 245); and (3) job performance. Moreover, affective responses could lead an employee to make efforts to change a situation that in turn could influence subsequent attitudes. They also hypothesized that (1) individual characteristics, (2) available information about a job and an organization, conceptualized as the "degree of complete information" (1981: 243), and (3) alternative job opportunities influenced job expectations and values. Individual characteristics and labor market and economic conditions were seen as the primary influences on alternative job opportunities.

Though there is some conceptual similarity, Steers and Mowday's (1981) model also differs from earlier models. In particular, Price (1977) proposed that interaction between job satisfaction and job opportunities is the immediate antecedent of an employee's leaving an organization. He also theorized that the contextual variables of pay, integration, instrumental communication, formal communication, and centralization were the primary determinants of job satisfaction. Steers and Mowday's explicit consideration of job satisfaction and perceived opportunity is consistent with Price's work, and their construct of organizational characteristics and experiences appears to be conceptually similar to his contextual variables. Unlike Price, however, Steers and Mowday proposed that (1) the immediate antecedent of an employee's leaving is the interaction of the intention to leave and alternative job opportunities and (2) organizational characteristics and experiences influence job satisfaction as part of a larger interaction involving job expectations, values, and performance.

In another major model, Mobley (1977) proposed a very detailed process that links employees' job satisfaction to their subsequently leaving an

FIGURE 1
The Steers and Mowday Model[a]
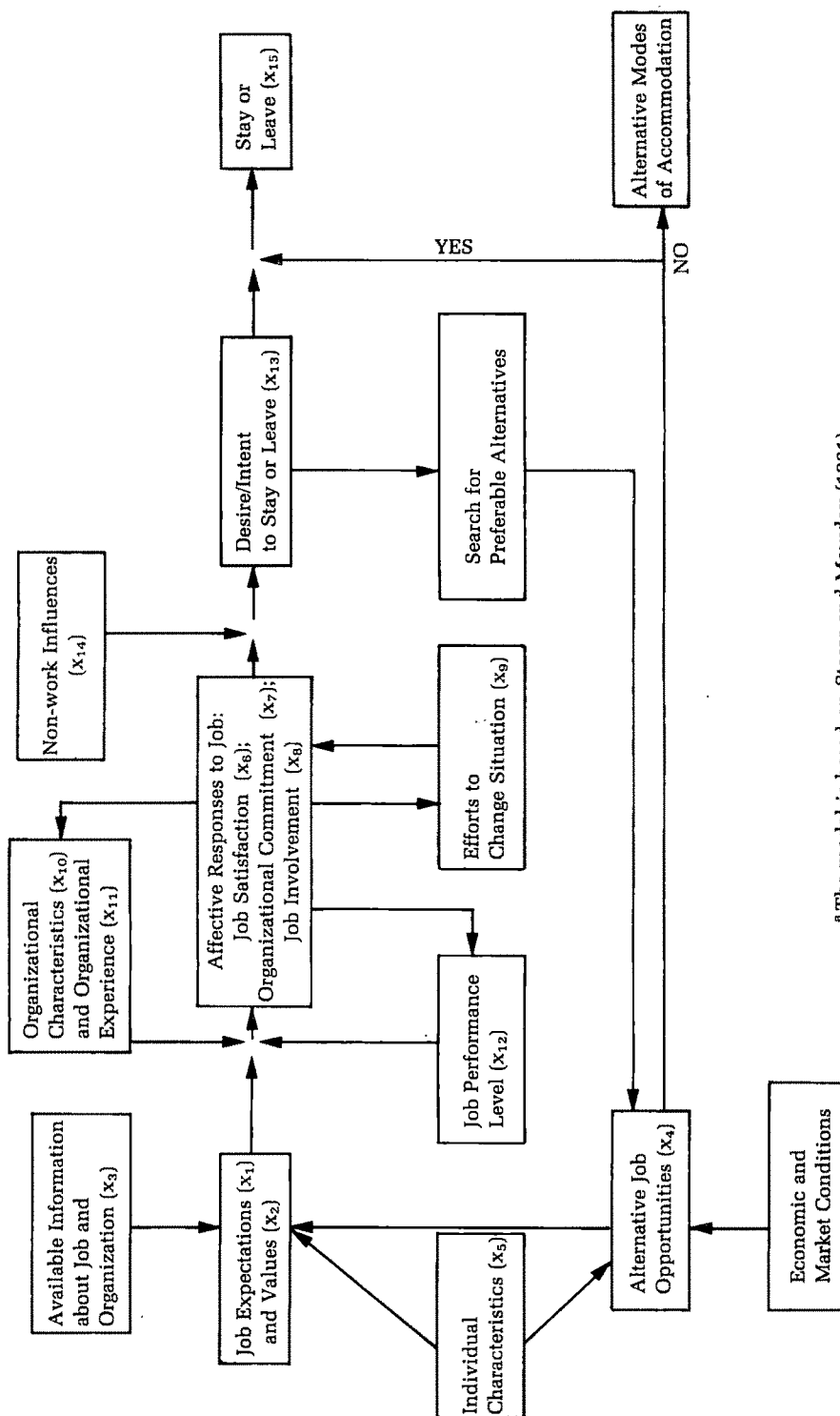
[a] The model is based on Steers and Mowday (1981).

organization. He theorized that the intermediate sequential linkages between satisfaction and leaving are thinking of leaving, evaluation of the expected utility of a search and the cost of leaving, an intention to search for alternatives, a search for alternatives, comparison of alternatives and the present job, and an intention to leave. In comparison to Steers and Mowday (1981), Mobley presented a more detailed linkage between attitude and behavior but fewer details on the likely antecedents of job satisfaction. Though many of the same constructs appear in both theories, they offer major, competing propositions about the process of searching for alternative jobs. Mobley theorized that search processes precede intention to leave, whereas Steers and Mowday theorized that search processes follow intention to leave.

Mobley, Griffeth, Hand, and Meglino (1979) proposed an expansion of Mobley's (1977) work. As did Steers and Mowday (1981), they identified a very large number of labor market, organizational, job, and individual variables as part of the leaving process. Like Steers and Mowday, Mobley and colleagues included cognitive variables in addition to job satisfaction. Their expanded version of Mobley's model also included a concept that Steers and Mowday did not explicitly consider; they theorized that the expected utilities of a present and alternative jobs multiplicatively combine with satisfaction. The specific linkage from this multiplicative cognitive construct to an employee's leaving an organization was, however, much less detailed than in Mobley's original (1977) version. However, whether searching for alternatives precedes or follows intention to leave remains a major competing proposition between the expanded Mobley model and Steers and Mowday's model.

Steers and Mowday's model also contains several unique aspects that further differentiate their work from earlier theory (1981: 248–249). First, they explicitly recognized the role of available information about a job and an organization. Second, they introduced job performance as an influence on affective responses. Third, they considered job attitudes other than satisfaction as antecedents to an employee's leaving. Fourth, they gave greater emphasis than did earlier theorists to nonwork influences as they affect intentions to leave. Finally, they recognized the possibility that disaffected employees may try to change a situation before leaving an organization. Discussing their model, Steers and Mowday (1981) suggested that those unique features offered a new research agenda to guide empirical work.

Evidence from Existing Research

Although the available research evidence is not extensive and focuses on selected linkages, it provides partial support of Steers and Mowday's (1981) model. Michaels and Spector (1982) conducted a partial test of the Mobley et al. (1979) model, but their results also corroborated several linkages predicted by Steers and Mowday. Using path analysis, they found that: (1) intention to leave was the immediate predictor of leaving; (2) job satisfaction and organizational commitment—a variable that Mobley and his colleagues did not explicitly consider—were the immediate antecedents of inten-

tion to leave; (3) job satisfaction was predicted by preemployment expectations, perceived job characteristics, and leader consideration; and (4) organizational commitment was predicted by leader consideration. The predictions involving intentions and actual leaving were in direct agreement with Steers and Mowday (1981). The relationships involving job satisfaction and organizational commitment also agree with Steers and Mowday if we infer some conceptual similarity between what Michaels and Spector called preemployment expectations, perceived job characteristics, and leader consideration and what Steers and Mowday called job expectations and organizational experiences.

Arnold and Feldman (1982) reported data that were relevant to both the Mobley et al. (1979) and Steers and Mowday (1981) models. Confirming Steers and Mowday, Arnold and Feldman found that job satisfaction and organizational commitment were predictors of intention to search for another job and by inference, actual job search. Contrary to both the models, intention to search was a better predictor of an employee's actually leaving than was intention to leave. Moreover, tenure and job security explained more variance in actual leaving than did intention to search.

In a longitudinal test of Mobley and colleagues' model (1979) that is also relevant to the model with which we are chiefly concerned (Steers & Mowday, 1981), Youngblood, Mobley, and Meglino (1983) found that job satisfaction and the expected utility of present military roles differentiated among early leavers, later leavers, and stayers, whereas individual differences and the expected utility of alternative civilian roles did not. If we assume some conceptual similarity between the expected utility of present military roles and Steers and Mowday's job expectations and values, the results agree with their model's predictions.

Motowidlo and Lawton (1984) found evidence through path analysis for the following sequence: (1) intention to leave was the immediate predictor of military reenlistment, (2) expectation of reenlistment and of leaving were the immediate antecedents of intention to leave, and (3) job satisfaction and perceptions of a job predicted expectation of reenlistment. These results agree with Steers and Mowday's conceptualization if we assume that there is some conceptual overlap between intention to leave and expectation of reenlistment and leaving.

In a longitudinal study, Stumpf and Hartman (1984) conducted a partial test of Steers and Mowday's (1981) model. From a path analysis, they found that (1) the immediate predictor of an employee's leaving an organization was environmental exploration, (2) intention to leave was the immediate antecedent to environmental exploration and was negatively related to job satisfaction and organizational commitment, and (3) person-job congruence and work performance predicted job satisfaction, and job-unit influence and work performance predicted organizational commitment. Such linkages appear to be in strong agreement with Steers and Mowday's model.

The cited studies were partial tests, each investigating only some of the theoretical linkages. Most of the studies were not intended to test Steers and

Mowday's (1981) model directly; interactive relationships predicted by that model frequently went untested in the studies. Additionally, interpretations are difficult because different investigators called conceptually similiar variables by different names. Despite these limitations, the studies do provide preliminary evidence of validity and,.at a minimum, justify further, more comprehensive research. The specific purpose of the present study was to examine the variables and theorized relationships specified by the model more comprehensively than earlier studies have done.

Predictions

Steers and Mowday (1981) created a general conceptual model rather than a precisely defined theory. Their model serves to integrate previous research on employees' leaving organizations and to suggest linkages among variables. Empirical tests are difficult because the model is stated in somewhat general terms. There is a certain amount of conceptual ambiguity within the model that makes it difficult to deduce testable propositions. Where the model explicitly specifies relationships, deduction of tests was very straightforward. Where it was ambiguous, deduction of tests was based on our interpretation.

Steers and Mowday (1981) theorized that met expectations (x_1) and job values (x_2) are linear additive functions of available information about a job and an organization (x_3), alternative job opportunities (x_4), and individual characteristics (x_5). To test these relationships, we assessed the following predictions:

> *Hypothesis 1: Regressing met expectations (x_1) onto available information about a job and an organization (x_3), alternative job opportunities (x_4), and individual characteristics (x_5), will yield a significant R^2, and each predictor variable will explain a significant proportion of unique variance.*
>
> *Hypothesis 2: Regressing job values (x_2) onto the same linear combination of available information about a job and an organization (x_3), alternative job opportunities (x_4), and individual characteristics (x_5) will yield a significant R^2, and each predictor variable will explain a significant proportion of unique variance.*

Steers and Mowday (1981) theorized that affective responses to a job like job satisfaction (x_6), organizational commitment (x_7), and job involvement (x_8) are a function of efforts to change a situation (x_9) and the interaction of met expectations (x_1), job values (x_2), organizational characteristics (x_{10}), organizational experiences (x_{11}), and job performance (x_{12}). In terms of a regression equation, we conceptualized efforts to change a situation (x_9) as having a main effect and saw the other variables $(x_1, x_2, x_{10}, x_{11}$ and $x_{12})$ as interacting. Because Steers and Mowday did not specify the nature of the interaction

among x_1, x_2, x_{10}, x_{11} and x_{12} we assumed that a multiplicative five-way interaction among variables should be tested with hierarchical regression (Cohen & Cohen, 1983).

> *Hypothesis 3: There are significant correlations between efforts to change a situation (x_9) and these affective responses: job satisfaction (x_6), organizational commitment (x_7), and job involvement (x_8).*

> *Hypothesis 4: In a hierarchical regression in which each affective response $(x_6, x_7,$ and $x_8)$ is regressed onto the main effects of efforts to change a situation (x_9), met expectations (x_1), job values (x_2), organizational characteristics (x_{10}), organizational experiences (x_{11}), job performance (x_{12}), and the interactions among x_1, x_2, x_{10}, x_{11}, and x_{12}, each R^2 will be significant.*

> *Hypothesis 5: For each equation designated in Hypothesis 4, the presence of each predictor variable will explain a significant proportion of variance over a comparable equation with that predictor omitted. In other words, each predictor will explain a significant proportion of incremental variance.*

Steers and Mowday (1981) also theorized that intention to leave (x_{13}) is a function of an interaction between affective responses to a job $(x_6, x_7,$ and $x_8)$ and nonwork influences (x_{14}). Again, they did not clearly specify the nature of the interaction. We assumed that a multiplicative interaction was appropriate and that our analyses had to accommodate in a meaningful fashion a possible four-way interaction (Cohen & Cohen, 1983). To test these relationships, the following predictions were assessed with hierarchical regression.

> *Hypothesis 6: When intention to leave (x_{13}) is regressed onto job satisfaction (x_6), organizational commitment (x_7), job involvement (x_8), nonwork influences (x_{14}), and the interactions among x_6, x_7, x_8, and x_{14}, the R^2 will be significant.*

> *Hypothesis 7: In the equations designated in Hypothesis 6, each predictor variable will explain a significant proportion of variance over a comparable equation with that predictor omitted. In other words, each predictor will explain a significant proportion of incremental variance.*

Steers and Mowday (1981) also predicted a relationship between intention to leave and an actual search for better alternatives.

> *Hypothesis 8: There is a significant correlation between intention to leave and search for preferable alternatives.*

Finally, Steers and Mowday predicted that an employee's leaving an organization (x_{15}) is a function of intention to leave (x_{13}), alternative job opportunities (x_4), and their interaction $(x_{13}x_4)$. To test this relationship, the following predictions were assessed with hierarchical regression.

> Hypothesis 9: Regressing an employee's leaving (x_{15}) onto
> intention to leave (x_{13}), alternative job opportunities (x_4),
> and their interaction $(x_{13}x_4)$ will yield a significant R^2, and
> the interaction term will explain a significant proportion
> of unique variance.

To actually predict leaving, we conducted ordinary least squares and log linear regression analyses. Both analyses provide useful information but have limitations. A binary dependent variable like staying or leaving seriously violates the assumptions of ordinary least squares regression. The error terms from prediction cannot be normally distributed nor homoscedastic. Consequently, probabilistic inferences become tenuous, and all estimates are statistically inefficient. In contrast, log linear models better meet the underlying assumptions and allow for meaningful probability statements and statistically efficient estimates (Cox, 1970). With a binary outcome variable, ordinary least squares regression does provide, however, a correct description of the data, and statistical estimates are unbiased. Because organizational researchers so readily understand ordinary least squares correlation and regression, the value of such description should not be overlooked in a search for inferential purity. We suggest that both ordinary least squares and log linear (or similar) models can contribute to understanding data and should be routinely reported.

> Hypothesis 10: Applying log linear analyses to the functional model from Hypothesis 9, $x_{15} = f(x_{13}, x_4, x_{13}x_4)$, will
> yield results equivalent to those found in that prediction:
> the overall log linear model will significantly predict
> leaving, and the interaction will significantly increase predictive accuracy.

METHODS

Sites and Respondents

The study was conducted at a major financial institution in the western United States that employed approximately 14,000 people throughout the state. From the outset, the study was basic research involving no formal relationship between the host organization and us, nor any consulting services or fees; management simply responded positively to our research proposal. Respondents worked in the following departments: financial administration, credit policy, U.S. banking, special industries, international banking, data processing, communications, global funds, international operations, security, and support services. The retail banking group, or branch banks, declined to participate.

To identify potential respondents, we used a stratified random sampling procedure. We stratified the company by participating departments and sent surveys via internal company mail to samples that constituted 40 percent of the full-time work force. Each person who had been randomly identified for participation received four letters. The first and second, sent one week be-

fore the actual survey, were respectively written by the senior vice-president of personnel and the senior researcher. Both letters stated that (1) out-of-state, university-based researchers were initiating a study, (2) participation was voluntary but encouraged, (3) confidentiality was guaranteed, and (4) the company fully endorsed participation. The third and fourth letters, also respectively written by the senior vice-president and senior researcher, accompanied the survey and reiterated points from the first two letters. We administered the survey in July 1983.

The targeted population consisted of 4,053 full time employees. For the targeted sample and the number of surveys sent via company mail, n = 1,621. We received 445 (27%) completed questionnaires; we had provided stamped, self-addressed envelopes. Table 1 shows a comparison of individual characteristics and rates of voluntary leaving for the entire company, the targeted population, and the respondents.

Chi-square tests comparing the expected and observed frequencies of individual characteristics were calculated between the respondents, the entire company, and the targeted population. For marital status, age, and tenure, no differences emerged. For race, no difference emerged between the respondents and company employees as a whole, but there was a difference between the respondents and the targeted population (p < .05). More specifically, there was a significantly higher percentage of whites in the sample than in the targeted population and a significantly lower percentage of blacks,

TABLE 1
Personal Characteristics and Rates of Voluntary Leaving

Variables	Entire Company	Targeted Population	Respondents
Marital status			
Single	43%	50%	47%
Married	57%	50%	53%
Race			
White	61%	42%[a]	63%
Black	10%	14%[a]	7%
Hispanic	15%	19%[a]	10%
Asian American	13%	24%[a]	13%
American Indian	1%	1%	1%
Gender			
Men	28%[a]	40%	45%
Women	72%[a]	60%	53%
Age	35 years	35 years	38 years
Tenure	6 years	5 years	4 years
Status			
Exempt	32%	37%	53%[b]
Nonexempt	68%	73%	38%[b]
Rates of leaving	20%	7%	8%

[a] The percentage for respondents significantly differs from this value (p < .05).

[b] This percentage for respondents significantly differs from both the company and population values (p < .05).

Hispanics, and Asian Americans. For gender, a difference emerged between the respondents and the company ($p < .05$), but no difference was found between the respondents and targeted population. The sample had a significantly higher percentage of men than the company's employees as a whole. Differences in status emerged involving all three groupings ($p < .05$). The sample contained a significantly higher percentage of exempt employees than did either the targeted population or the company.

Nine months after administration of the survey, the company generated a list of persons who had left and their reasons for leaving. The list covered the entire period. Respondents had voluntarily provided their names and social security numbers on the survey, allowing us to list them. By comparing the two lists, we identified stayers and leavers. We adopted the nine-month period at the host organization's request. There is no accepted timeframe for the prediction of leaving.

For the nine-month period, the rates at which employees left were 20, 7, and 8 percent for the entire company, the targeted population, and the respondents, respectively. There were 36 voluntary leavers among the respondents. Chi-square tests indicated a significant difference between the rates of leaving for the respondents and the company ($p < .05$) but no difference between the respondents and the targeted population. We attribute the discrepancy between the respondents' and company's rates to the exclusion of the retail banking group from the targeted population. In retail banking, turnover rates are usually very high, with annual rates of 50 percent or more fairly common. Management considered the percentage for the targeted population of nonretail employees to be typical of their company and industry, and it is very close to the rate for the respondents.

Although the significant differences found above may indicate sampling bias in the data and may limit generalizability, the voluntary nature of the study made them unavoidable. The closeness between the leaving rates for the respondents and the targeted population suggests minimal sampling bias.

Measures

A single-item supervisory rating of overall job performance was available from company records. The same for all employees, the item was part of the company's annual mandatory performance-appraisal system and was a major factor in determining annual pay increases and career advancement. We could not gain access to other parts of the appraisal system, which contained many behavioral ratings and 25–100 word written explanations of each rating.[1] The 5-point performance ratings we obtained were from employees' last evaluations, which had occurred from one year to one week before the survey. We considered the single-item performance data acceptable for three reasons: the company's performance evaluation system appeared to have been very carefully developed, and the developer, an industrial psychologist who held a Ph.D. degree, administered it; company management considered the performance data valuable, and the data were

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[1] Supervisors assigned the overall performance ratings after assessing behavior and writing the explanations.

major factors in personnel related decisions; and no other performance measure was available. The Appendix gives the performance item and all other nonstandard survey items as well as response formats and reliabilities (α).

Of the ten scales we used, five had internal consistencies in the .90s, three had values in the .80s, and two had values in the .70s. Thus, we used an averaged composite for each scale, and we also factor-analyzed each of them. The resulting matrices were remarkably clear and generally supported the unidimensionality of each scale.[2] Factor solutions were based on scree tests, eigenvalues, and interpretability.

Respondents were asked to describe how well their expectations about their immediate supervisor, kind of work, co-workers, physical working conditions, financial rewards, career future and company identification, and their overall jobs had been met. We drew these referents from publications on the model (Steers & Mowday, 1981: 241; Mowday, Porter, & Steers, 1982: 123). They are also the dimensions used in the Index of Organizational Reactions (Dunham, Smith, & Blackburn, 1977).

Respondents were also asked to describe the relative importance of eight sources of information about their jobs and organization. The scale was conceptually the same as Steers and Mowday's "degree of complete information" (1981: 243). Through interviews with the manager of personnel research, we identified these as the company's major mechanisms for organizational communication: bank recruiters, the new employee orientation and information packet, work friends, supervisor or manager, a job awareness program, *The Banker* (a company publication), policy manuals and bulletins, and Q (a personnel publication). All sources were readily available to all employees. We considered the importance of each source to what employees knew about the bank to be an indication of the completeness of their information sets. We also asked respondents how much they knew about other jobs they might like to have and about the bank in general to assess the completeness of their information.

Job satisfaction was measured with the Index of Organizational Reactions (Dunham et al., 1977: 420–432). We measured organizational commitment with the short form of the Organizational Commitment Questionnaire (Mowday, Steers, & Porter, 1979: 224–247) and job involvement with the short-form of the scale developed by Lodahl and Kejner (1965: 24–33).

Survey respondents were asked to describe their efforts to change the situation when they were unhappy with their job. We asked about their use of five change tactics suggested by Steers and Mowday (1981: 246).

Respondents also described how important each of ten organizational characteristics, including job content, co-workers, and general atmosphere, were to how they felt about their jobs. We chose the characteristics on the basis of published work on the model (Mowday, Porter, & Steers, 1982: 126–127; Steers & Mowday, 1981: 245). The manager of personnel research indicated that several corporate officers and members of the personnel research division had reviewed the listed characteristics and agreed that the

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[2] The first author will provide the factor-pattern matrices on request.

characteristics were particularly important influences on affective responses to jobs.

Respondents were also asked to describe their reactions to 13 organizational experiences, such as race relations, employee participation, and compensation equity. We selected the experiences through interviews with the managers of the personnel research and personnel information systems. In these interviews, we discussed examples of organizational experiences given by Steers and Mowday (1981: 245) and attempted to identify experiences that management considered particularly important and salient to organizational members. The identified organizational experiences represented areas in which senior management had invested considerable time and money.

On the basis of suggestions and examples in Steers and Mowday (1981: 246–247), we identified 14 nonwork influences and asked respondents how important each was to how they felt about their job.

The definition of values was perhaps the most poorly specified variable in Steers and Mowday's (1981) model, perhaps because the concept of values has been defined in many ways in the literature. Consequently, measurement was very difficult. At the request of the host organization, we accepted the conceptual and operational definitions recommended by the manager of personnel research. Respondents were asked how consistent the bank's (1) quality standards (e.g., performance) and (2) operational procedures (e.g., internal auditing) were with their personal and professional values and judgments.

Two items assessed intention to leave. To increase reliability, we averaged the two. Because direct assessment of search behavior was not possible, we used two surrogate items. Alternative job opportunities were assessed with, "All in all, what is the likelihood that you could find an acceptable alternative with another company?" Finally, we obtained data on individual characteristics with fill-in items for age, gender, number of dependents, educational level, supervisory experience with the bank, and nonsupervisory experience with the bank.

Analyses

The primary analyses in this study were correlations and hierarchical regression. We chose not to use structural equations or path analysis. The presence of feedback loops defines Steers and Mowday's (1981) model as a nonrecursive system. We would thus need instrument variables in order to apply either structural equations or path analysis (Cohen & Cohen, 1983; Heise, 1975). Neither the model nor our data contained such variables. Without them, we could not analyze the feedback loops and thus would have to omit them. Moreover, the model specifies interactive relationships among variables but does not explicitly define the nature of those interactions. Though we believe that our assumption of a multiplicative interaction justifies the current analysis, the model seems too poorly specified for the causal modeling of interactions (Cohen & Cohen, 1983). Without further theoretical

guidance, we would find the interactions very difficult to analyze and would need to omit them as well.

In our judgment, it was important to maximize the fidelity between the conceptual model and our empirical analysis. By omitting the feedback loops and interaction terms, we would, in effect, have changed the model to fit the analysis. Moreover, even if the analysis supported an adjusted Steers and Mowday model, the meaning of the results would be ambiguous. We did not consider changing the model in order to apply a stronger statistical method to be a reasonable tradeoff nor an improvement over our current analysis.

RESULTS

Table 2 shows the means, standard deviations, and correlations for the variables in the present study.

In Hypotheses 1 and 2, we theorized that met expectations and job values were linear additive functions of available information about a job and an organization, alternative job opportunities, and individual characteristics. The regression of met expectations onto the three constructs yielded $R^2 = .07$ ($p < .001$). That for job values yielded $R^2 = .22$ ($p < .001$).

We estimated the proportion of unique variance explained by each construct for both equations. Available information about job and organization explained 6 percent of the variance ($p < .001$) in met expectations, whereas alternative job opportunities and individual characteristics each explained less than 1 percent (n.s.). For job values, available information explained 19 percent of the variance ($p < .001$) and individual characteristics explained 3 percent ($p < .01$). Alternative job opportunities explained less than 1 percent (n.s.).

In Hypotheses 3, 4, and 5, we captured the model's prediction that affective responses are a function of (1) efforts to change a situation and (2) the interaction of job performance, met expectations, job values, organizational characteristics, and organizational experiences. The bivariate correlations between efforts to change a situation and job satisfaction, organizational commitment, and job involvement were, respectively, $r = -.09$ ($p < .05$), $-.01$ (n.s.), and .06 (n.s.). Using each affective response as the dependent variable, we computed three hierarchical regression equations (Cohen & Cohen, 1983), entering efforts to change a situation first in each equation. We entered the other predictor variables second, as a set. The corresponding interactions among the other predictor variables—with efforts to change a situation omitted—were entered third. Examining the full models, we found statistically significant relations for satisfaction ($R^2 = .64, p < .001$), organizational commitment ($R^2 = .51, p < .001$), and job involvement ($R^2 = .38, p < .001$).

In order to estimate the percentages of incremental variance explained by each variable, we repeated hierarchical analysis, omitting a main effect and its corresponding interactional influences with each repetition. By comparing the full and shortened models, we estimated the percentages of incremental variance. Table 3 shows these percentages. Although efforts to change a

TABLE 2
Means, Standard Deviations, and Correlations[a]

Variables	Means	Standard Deviations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Age	38.07	12.36																				
2. Number of dependents	1.14	1.33	22																			
3. Education[b]	4.56	1.20	-10	06																		
4. Supervisory experience with company	2.91	5.15	39	14	-04																	
5. Nonsupervisory experience with company	5.08	5.19	39	03	-19	-05																
6. Job performance	3.25	0.64	-06	-03	-05	00	05															
7. Search behavior (1)	2.23	1.22	-32	-08	18	-17	-28	-02														
8. Search behavior (2)	0.96	3.11	-16	-09	17	-09	-11	-01	33													
9. Alternative job opportunities	3.98	0.97	-12	-04	20	12	-14	08	08	05												
10. Met expectations	2.92	0.70	-06	04	-05	-01	-03	13	-13	-07	03											
11. Organizational commitment	3.25	0.80	13	11	-08	00	07	09	-19	-16	-04	33										
12. Job satisfaction	3.28	0.64	17	08	-08	05	12	11	-30	-17	03	47	70									
13. Job involvement	3.00	0.73	17	12	00	09	00	05	-07	-06	01	18	61	46								
14. Nonwork influences	3.52	0.76	-11	06	-15	-10	08	-11	-04	02	-07	-02	27	20	28							
15. Organizational characteristics	4.18	0.66	-06	-01	01	-01	-01	05	-02	06	10	11	41	37	45	62						
16. Values	3.24	0.94	-10	10	00	09	03	-05	-16	-13	00	33	50	47	40	15	25					
17. Available information about job and organization	3.25	0.86	-07	-04	-18	-08	08	06	-06	00	-02	22	47	41	32	44	49	37				
18. Efforts to change situation	1.60	0.67	-07	-05	09	-03	02	-03	17	06	-03	-06	-01	-09	06	10	10	01	14			
19. Organizational experiences	3.17	0.59	09	03	-13	04	09	11	-23	-15	05	41	51	65	33	14	23	44	37	-09		
20. Intention to leave	2.94	1.14	-30	-12	12	-03	-21	-05	35	14	16	-27	-35	-44	-22	01	-05	-27	-10	12	-36	
21. Leaving[c]	0.08	0.27	-10	-04	05	-07	-11	-01	16	09	06	04	-10	-16	-10	-03	-07	-04	-07	03	-06	24

[a] $r = .09$ is significant at $p < .05$.

[b] The following scale was used: 1 = grade school, 2 = some high school, 3 = high school diploma, 4 = some college, 5 = BS/BA/BAA, 6 = some graduate school, 7 = MA/MS/MBA, 8 = JD/Ph.D./LLB.

[c] 0 = stay, 1 = leave.

TABLE 3
Incremental Contribution to Percent of Variance Explained
from the Inclusion of Each Predictor Variable

Predictor Variables	Dependent Variables		
	Job Satisfaction	Organizational Commitment	Job Involvement
Efforts to change job	0.4*	0.0	0.1
Expectations	6.6**	3.6*	3.7*
Values	6.2**	9.2**	6.7**
Organizational characteristics	8.5**	10.2*	12.5**
Job performance	2.2	4.1**	5.0**
Organizational experiences	18.7**	9.1**	4.2*
Total R^2	64.0***	51.0***	38.0***

* $p < .05$
** $p < .01$
*** $p < .001$

situation do not appear to be a correlate of affective responses, the five other variables explained a significant percentage of incremental variance in each attitude.

In Hypotheses 6 and 7, we theorized that intention to leave was a function of an interaction between affective responses and nonwork influences. When intention to leave was regressed onto job satisfaction, organizational commitment, job involvement, nonwork influences, and their interactions, $R^2 = .28$ ($p < .001$). We again estimated the proportion of incremental variance explained by each variable by calculating full and shortened hierarchical regression models. Job satisfaction incrementally explained 12.4 percent of the variance ($p < .01$); organizational commitment incrementally explained 4.1 percent ($p < .01$); job involvement, 2.4 percent ($p < .01$); and nonwork influences, 1.2 percent (n.s.).

Because of an interitem correlation of $r = .33$ ($p < .001$), we analyzed the two search items pertinent to Hypothesis 8 as separate variables. We used bivariate correlations to estimate the relationship between intention to leave and the first item measuring search behavior, "How actively have you searched for another job with another company in the last five years?" and the second, "How many jobs outside of the Bank have you applied for in the last year?" The correlations were $r = .35$ ($p < .001$) and $r = .14$ ($p < .01$), respectively. When intention to leave was regressed onto both search behavior items, $R^2 = .12$ ($p < .001$).

In the model and in Hypothesis 9, leaving an organization is a function of intention to leave, alternative job opportunities, and their interaction. The bivariate correlations between leaving, intention to leave, and alternative job opportunities were, respectively, $r = .24$ ($p < .001$) and $r = .06$ (n.s.). When we applied a hierarchical regression model ($R^2 = .05$, $p < .001$), the interaction

term explained less than 1 percent of unique variance (n.s.). With the interaction removed from the equation ($R^2 = .05, p < .001$), alternative job opportunities uniquely explained less than 1 percent of the variance (n.s), and the intention to leave uniquely explained 4 percent ($p < .001$).

The point biserial correlations between leaving, intention to leave, and alternative job opportunities were, respectively, .23 ($p < .001$) and $-.03$ (n.s.). Moreover, the empirical *estimate* for the probability of an employee's leaving was .08. For the targeted population, the *measured* parameter for the probability of an employee's leaving was .07. Allowing for some measurement error in the parameter value, the sample estimate and the population parameter for the probability of leaving appear to be fairly close and, therefore, statistically accurate. Correspondingly, the reported correlations also appear to be unbiased and statistically accurate. In generalizing the results beyond the targeted population to the entire company, however, the reported correlations may be underestimates of the true population values.

When log linear analyses were applied, the results were essentially equivalent. Only intention to leave predicted actual leaving. When intention to leave was entered, the log likelihood function was -90.73, with a chi-squared improvement of fit (over the constant) equal to 17.55 ($p < .001$). Alternative job opportunities did not improve prediction beyond the constant, and the interaction term did not improve prediction beyond the constant and main effects.

DISCUSSION

The theoretical work on the process through which an employee leaves an organization has generated several major models, and researchers have begun empirically evaluating these models. The empirical research has been fairly extensive for two of the models (Mobley, 1977; Price, 1977), but empirical testing of the others has lagged. The present study helped remedy this situation by empirically and fairly comprehensively testing Steers and Mowday's (1981) model. The present study is part of a growing body of theory-driven empirical research.

The model was tested with ten predictions deduced from published and unpublished sources. In general, we interpreted the results as partially supporting the model's major predictions. Hypotheses 1, 2, 4, 6, 8, and 9 tested the model's major relationships, and substantial support for those relationships emerged. When specific components of the model were examined in Hypotheses 1, 2, 5, 7, 9, and 10, only some of the variables made significant incremental contributions toward explained criterion variance.

In support of the model, available information about a job and an organization explained a significant proportion of unique variance in met expectations and job values. Job performance, met expectations, job values, organizational characteristics, and organizational experiences explained a significant proportion of incremental variance in affective responses. Job satisfaction, organizational commitment, and job involvement also explained a signifi-

cant proportion of incremental variance in intention to leave. Contrary to the model, however, alternative job opportunities did not explain a significant proportion of unique variance in met expectations and job values and did not contribute toward the prediction of an employee's leaving either directly or through interaction with intention to leave. Individual characteristics did not explain a significant proportion of unique variance in met expectations but did explain 3 percent ($p < .05$) of unique variance in job values. Efforts to change a situation did not explain a significant proportion of unique variance in affective reponses, and nonwork influences did not explain a significant proportion of incremental variance in intention to leave.

Steers and Mowday (1981) also suggested that their model contains several unique aspects. Results offered support for four of the unique aspects: available information about a job and an organization, job performance, organizational commitment, and job involvement were related to other variables as predicted in the model. Nonwork influences and efforts to change a situation did not, however, relate to other variables as theorized.

A noteworthy result of the present study was the relationship of job performance and affective responses. Prior job performance was significantly correlated with job satisfaction ($r = .11, p < .05$) and organizational commitment ($r = .09, p < .05$) but not with job involvement ($r = .05$, n.s.). Interestingly, when job performance was entered into the theorized interactional relationships that predicted affective responses, job performance explained a significant proportion of incremental variance in organizational commitment ($R^2 = .04, p < .05$) and job involvement ($R^2 = .05, p < .05$) but not job satisfaction ($R^2 = .02$, n.s.). Had we interpreted only the bivariate correlations, we might have missed the empirical evidence supporting a theorized linkage with job involvement. Considering the theorized interactions suggests that job involvement is of some theoretical value. Though Steers and Mowday (1981) were not explicit in explaining the exact nature of the theorized interaction, it seems that their model makes a contribution by directing empirical research toward a more complex relationship than the one they hypothesized.

Like Arnold and Feldman (1982), we found no evidence for the theorized interactional effect of intention to leave and available job opportunities. Furthermore, there is very little empirical evidence in the literature in general for a strong and consistent direct or interactive effect of available job opportunities on an employee's leaving (Hulin, Roznowski, & Hachiya, 1985). In our results, only the main effect of intention to leave predicted leaving. In addition to what was reported earlier, examination of the regression coefficients from the ordinary least squares and log linear regression models showed, as expected, only the coefficient for intention to leave to be significant. Consistent with results reported by Michaels and Spector (1982) and Motowidlo and Lawton (1984), our data corroborates the commonly accepted notion that the intention to leave an organization is the best predictor of actual leaving. On the basis of that emerging evidence—and contrary to Steers and Mowday's model—it appears that the multiplicative interaction

between intention to leave and alternative job opportunities is not the immediate antecedent to an employee's leaving an organization.

We also found no evidence for the theorized interactional effect of affective responses and nonwork influences on intention to leave. Instead, our data provided evidence for a simpler relationship between intention to leave and job satisfaction, organizational commitment, and job involvement. Like results previously reported by other researchers (Arnold & Feldman, 1982; Michaels & Spector, 1982; Motowidlo & Lawton, 1984; Stumpf & Hartman, 1984), our results suggest a direct relationship between affective responses and intention to leave. It should be noted, however, that the cited studies did not explicitly test for the interactional effect of affective responses and nonwork influences. Our study appears to have been the first such test. Despite our nonsupportive data, it seems inappropriate to recommend deleting nonwork influences and efforts to change a situation from the model on the basis of a single study.

The Steers and Mowday (1981) model represents a comprehensive summary of the extensive research on employees' leaving organizations. Yet our results indicated that the model explained only 5 percent of the variance in employees' leaving, which is slightly less than what has been explained in tests of other comprehensive models. Given their limited predictive validity, it is legitimate to question the value of such comprehensive models in general and of Steers and Mowday's model in particular. We suggest, however, that there are several reasons why such models have value and should continue to be focal points for empirical research. First, comprehensive models identify and categorize the various factors that previous research has found to be important to the leaving process. The models can therefore increase our understanding of that process by providing a comprehensive guide to possible causes. Although researchers tend to emphasize prediction as a criterion in judging models, we should not lose sight of the importance of understanding as a goal of scientific inquiry.

A second aspect of the models' value is that they provide direction for empirical research. Without such direction, research on employees' leaving organizations would totally ad hoc. Each researcher would probably focus on a subset of variables that he or she found interesting, with little regard for a larger network of variables that could influence the relationships under study. The likelihood that knowledge would accrue from such ad hoc research is minimal. Comprehensive models impose a degree of discipline on researchers and help ensure that evidence from various studies can accumulate in some meaningful fashion. As that process occurs, scholars can refine the theoretical models, which will in turn increase understanding of the process through which employees leave organizations.

Finally, we believe that comprehensive models have a practical value in helping managers think heuristically about possible causes for employees' leaving. In our experience, managers often feel they know why employees leave, even though their knowledge is seldom based on a systematic diagnosis of a situation. They frequently focus their attention on one plausible cause

of employees' leaving without considering a number of alternative explanatory variables. By comprehensively identifying antecedents and suggesting their general relationships, comprehensive models may help managers think more systematically about why employees leave. Variables that managers had not previously considered may become salient, possibly helping to identify potential strategies or interventions for increasing employee retention.

In summary, we believe that comprehensive models lead researchers and managers to a better understanding of the process through which employees leave the organizations. Not only do the models guide empirical research, they can also provide direction for managerial actions.

Future research on Steers and Mowday's (1981) model might take several directions. First, there is a simple need for additional direct and comprehensive tests. Though selected linkages from the model have received empirical attention, our study was the first to investigate the model in its entirety. Additional tests are required before theoretical refinements and improvements can be made.

Second, future research might improve upon our basic research design. In particular, the theoretically relevant correlates of leaving should be measured at multiple points in time. Longitudinal research designs would allow assessment of changes in specific variables and determination of directionality of relationships. Although it is easy to recommend longitudinal research, it is more difficult to suggest specific time intervals between surveys. To a large extent, the appropriate length may depend on the characteristics of particular organizations and work settings being studied. Investigators might consider at least three characteristics. Company policies that have relevance to employees' leaving are clearly important. For instance, some companies offer annual or periodic incentives for early retirement or voluntary resignation, and those policies may influence employees' expectations, attitudes, and intentions. Surveys might be administered before and after such windows of opportunity. Another factor worth considering is the predictability of a workload. Frequently, an organization's workload is cyclical, and the probability of leaving may covary with that cycle. For example, the likelihood of an employee's leaving may be greater before an expected increase than before an expected decrease in workload. Finally, investigators might consider seasonal factors like summer vacations, holidays, or annual bonus plans. For instance, employees' leaving may virtually cease before an annual bonus payment and increase significantly thereafter. Consideration of such characteristics may provide guidance to researchers on the timing of surveys to measure leaving.

Like other researchers, Steers and Mowday made predictions for all persons at all times and in all places in their model. It is possible that only portions of their model may be relevant to certain types of employees, and much more refined predictions of leaving may be needed in many situations. A third direction for future research might be refinement of their predictions through incorporating differences across certain types of employees into the

Steers and Mowday (1981) model. For example, future research might consider an individual's career stage (London & Stumpf, 1982) when predicting whether that employee will leave an organization. In an early career stage, an employee may be in the process of evaluating the job choice, learning about the job and organization, and deciding to stay or leave. Tasks and immediate work setting would be likely to be very salient in this evaluation process and very influential in the employee's decision to stay or leave. At a later career stage, that initial evaluation process would be complete, and the employee would have made a decision to stay. Other factors, like nonwork influences, would probably be more salient than the characteristics of a job and an organization in a leaving process begun later in a career. Because career stage may influence the importance of the various antecedents of leaving, incorporating career stage into the model might enhance prediction of employees' leaving.

There were two unavoidable methodological limitations in the present study. First, all variables except employees' leaving and job performance were collected with a single survey, so common method variance may have elevated many of the reported relationships. Though we fully acknowledge that problem, we believe this study nonetheless contributes to the literature by providing a fairly comprehensive test of Steers and Mowday's model. Furthermore, in testing large and complex models, independent measurement of the numerous variables becomes very difficult; concurrent measurement of variables and some common method variance may be virtually unavoidable. Parenthetically, two key behavioral variables—leaving and performance—were included, which may help compensate for some possible common method variance. Second, the low response rate may have resulted in sample bias. We also fully acknowledge this problem but note that the absolute sample size was fairly large ($n = 445$). That largeness may help minimize other potential statistical sampling problems (power, standard error), and thus the results may still yield valuable, though imperfect, information.

Despite these unavoidable problems, this study strengthened our general confidence in Steers and Mowday's model. Perhaps even more important than providing corroborating evidence, our results identified potential flaws in the model. Identifying flaws offers researchers an opportunity to determine whether a model needs modification, and if so, to recommend what changes would be appropriate. It is through such systematic theory-driven research that we will improve the model and come to understand the process through which employees leave organizations.

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APPENDIX

Overall performance rating. Supervisors were asked to assign the performance level that most closely matched one of the following descriptions below:

5 = Clearly outstanding. Results and job-related behavior have *far exceeded* expectations in *all major areas* of responsibility. Employees at this level have demonstrated complete job proficiency and the highest standards of performance in achievement of job responsibilities.

4 = Exceeds expectations. Results and job-related behaviors have *consistently* exceeded expectations in *most areas* of responsibility. Employees at this level are fully qualified in all aspects of the job and have demonstrated ability to achieve results and make contribution significantly above what would be expected of most employees performing similar work.

3 = Fully satisfactory. Results and job-related behaviors have *consistently met* expectations in *all major areas* of responsibility. Employees at this level accomplish all basic position requirements. Key assignments are adequately fulfilled and the general level of performance meets expectations. *May occasionally exceed* expectations *in some areas*.

2 = Needs improvement. Results and job-related behaviors *have not fully met* expectations *in some areas* of responsibility. Employees at this level fulfill most basic position requirements, but there is room for improvement. Employee has capacity to reach fully satisfactory performance, or better, with reasonable effort.

1 = Clearly unsatisfactory. Results and job-related behaviors *consistently have not met* expectations *in most areas* of responsibility. Employees at this level demonstrate unacceptable performance. Potential for improvement must be evident within a stated period or the employee should be considered for demotion or termination.

Met expectations (α = .85). Respondents chose one response to complete each of the following statements: In general, my experiences with (1) my immediate supervision have been, (2) the kind of work that I do have been, (3) the amount of work that I do have been, (4) my co-workers have been, (5) the physical conditions have been, (6) the financial aspects (e.g., pay, benefits) have been, (7) matters affecting my career future have been, (8) matters affecting my identification with the Bank have been, (9) all in all, have your expectations been met?

The anchors were: 1 = less than expected, 2 = somewhat less than expected, 3 = as expected, 4 = somewhat more than expected, 5 = much more than expected.

Available information about the job and the organization (α = .91).

1. How important are the following to what you know about the Bank? (a) Bank recruiters, (b) New employee orientation and information packet, (c) Work friends, (d) Your supervisor/manager, (e) Job Awareness Program, (f) *The Banker*, (g) Policy manuals/bulletins, (h) Q.
2. Consider other jobs in the bank that you would be interested in having. How much do you know about these jobs?
3. In general, how much do you know about the Bank (e.g., how it runs, who's who, career opportunities, how to get things done)?

For item 1, the anchors were: 1 = not at all important, 2 = unimportant, 3 = neither unimportant nor important, 4 = important, 5 = very important. For items 2 and 3, the anchors were: 1 = virtually nothing, 2 = little, 3 = some, 4 = much, 5 = very much.

Efforts to change the job (α = .74). When you were unhappy with something about the job, how frequently did you actually do the following? (1) Transfer, (2) Change the job itself, (3) Change your responsibilities, (4) Threaten to leave, (5) Force someone else to leave.

The anchors were: 1 = never, 2 = infrequently, 3 = some, 4 = frequently, 5 = very frequently.

Organizational characteristics (α = .92). How important are the following to how you feel about your job? (1) Bank goals, (2) Bank policies and practices, (3) Reward for good work, (4) Job content, (5) Supervision, (6) Co-workers, (7) General atmosphere at the work place, (8) Your job level, (9) Your skill level, (10) "General Professionalism."

The anchors were: 1 = not at all important, 2 = unimportant, 3 = neither unimportant nor important, 4 = important, 5 = very important.

Organizational experiences (α = .82).

1. The relations between employees of different races are usually good.
2. The bank usually promotes qualified company people before hiring outsiders.
3. Compared with other people who work for the bank, I think I am fairly paid.
4. From what I hear, our pay is as good or better than in other organizations.
5. In my opinion, the Job Awareness Program is working well.
6. Most of the *employees* I know support the company's effort in the area of EEO.
7. The method of determining pay increases offers little incentive to do a good job.
8. I find it difficult to understand the bank's benefit programs.
9. I feel free to make use of the Tell It Like It Is Program.
10. Sufficient effort is made to get the opinions and thinking of people who work here.
11. If I am dissatisfied with my supervisor's decision on an important matter, I feel free to go to someone higher in authority.
12. I feel that management supports Equal Employment Opportunities laws and policies.
13. How satisfied are you with the information you receive from management on what is going on in the company?

For items 1–12, the anchors were: 1 = strongly disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree, 5 = strongly agree. For item 13, 1 = very dissatisfied, 2 = dissatisfied, 3 = neither dissatisfied nor satisfied, 4 = satisfied, 5 = very satisfied.

Nonwork influences (α = .89). How important are the following to how you feel about your job? (1) Unemployment rate in general, (2) Unemployment rate in your job type, (3) Visibility of other jobs you would be interested in, (4) Time left for family, (5) Personal lifestyle, (6) Where you live, (7) Spouse's job, (8) Religious beliefs, (9) Personal morals, (10) Recreational activities, (11) Social life, (12) Likelihood of transfer, (13) Leave of absence policies, (14) Continuing education policies.

The anchors were: 1 = not at all important, 2 = unimportant, 3 = neither unimportant nor important, 4 = important, 5 = very important.

Values (α = .95).
1. Bank *STANDARDS* are consistent with: (a) My personal values, (b) My personal judgments, (c) My professional values, (d) My professional judgments.
2. Bank *PROCEDURES* are consistent with: (a) My personal values, (b) My personal judgments, (c) My professional values, (d) My professional judgments.

The anchors were: 1 = strongly disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree, 5 = strongly agree.

Intention to leave (α = .59).
1. If you happened to learn that a good job was open in another company, how likely is it that you would actively pursue it?
2. How likely is it that you will be with the Bank five years from now?

The anchors were: 1 = very unlikely, 2 = unlikely, 3 = neither unlikely nor likely, 4 = likely, 5 = very likely.

Search.
1. How actively have you searched for a job with another company in the last five years?
2. How many jobs outside of the Bank have you applied for in the last year? Indicate no. _____.

For item 1, the anchors were: 1 = not at all, 2 = inactively, 3 = somewhat actively, 4 = actively, 5 = very actively. Item 2 required respondent to fill in a number.

Alternative job opportunities.
1. All in all, what is the likelihood that you could find an acceptable alternative with another company?

The anchors were: 1 = very unlikely, 2 = unlikely, 3 = neither unlikely nor likely, 4 = likely, 5 = very likely.

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DO GOOD OR POOR PERFORMERS LEAVE?
A META-ANALYSIS OF THE RELATIONSHIP
BETWEEN PERFORMANCE AND TURNOVER

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A meta-analysis designed to estimate the direction and magnitude of the correlation between turnover and employee performance was conducted. The sample size–weighted mean correlation across 24 studies involving 7,717 individuals was found to be −0.28, suggesting that turnover is lower among good performers. Considerable unexplained variance in correlation coefficients across studies remained after correction for sampling error and attenuation. We found some support for three potential moderators: type of turnover, time span of measurement, and level of unemployment. Further, subgroup analyses suggested that a potential confound in meta-analyses—the degree of departure from a 50–50 split on a dichotomous dependent variable—may have important effects in some situations.

The relationship of employees' performance to turnover is a topic of growing interest, as evidenced by increasing attention to performance as a variable in model-building (Jackofsky, 1984; Rhodes & Doering, 1983; Steers & Mowday, 1981) and in empirical studies (Dreher, 1982; Jackofsky, Ferris, & Breckenridge, 1986; Martin, Price, & Mueller, 1981; Sheridan, 1985; Stumpf & Hartman, 1984). We can suggest at least three reasons for this increased interest. First, despite voluminous previous research on the correlates of turnover, the variance explained by present models remains small (Steele & Ovalle, 1984). Therefore, scholars have made few advances in understanding the phenomenon (Mobley, 1982).

Second, we know even less about the causes of turnover. Correlation does not, of course, equal causation. In fact, there seems to be an emerging sense that little of what we have learned about turnover can be described as causal knowledge (Clegg, 1983) or can be of any practical use in helping managers reduce turnover among valued employees (McEvoy & Cascio, 1985). The strongest relationship found to date is between intent to quit and turnover (Steele & Ovalle, 1984). However, knowledge of intentions is not readily available to managers in most organizations, and even if it were, it would be of little value in suggesting ways to deal with an employee's decision to quit.

Third, there has been increasing interest in the consequences of turnover, an area of study neglected in most previous research (Steers & Mowday, 1981). Traditionally, investigators have assumed that turnover is a negative phenomenon for organizations because valuable employees are lost, but recent investigations have begun to question that assumption (Abelson & Baysinger, 1984; Dalton & Todor, 1982). The relationship between performance and turnover weighs heavily in the determination of whether the organizational consequences of turnover are generally positive or generally negative (Boudreau & Berger, 1985; Hollenbeck & Williams, 1986). An organization that loses a disproportionately high number of its good performers would have more cause for concern than one that loses predominantly poor performers. In other words, "the organizational consequences of turnover are dependent on *who* leaves and *who* stays" (Mobley, 1982: 42).

Clearly, research into the relationship between turnover and performance is important for determining the nature of the consequences of employees' leaving. It also may be helpful in furthering our understanding of both the causes and correlates of turnover. The formulators of several recent models have incorporated performance as a variable, speculating that its inclusion would increase the explanatory power of the models (Jackofsky, 1984; Rhodes & Doering, 1983; Steers & Mowday, 1981; Stumpf & Hartman, 1984). The present research suggested that this speculation is well founded.

Present models are equivocal regarding the role of performance in the turnover process. Many models are intellectual descendants of March and Simon's (1958) approach, which suggested that turnover was a function of the perceived desirability and ease of movement. Theorists who take such approaches (e.g., Jackofsky, 1984; Martin et al., 1981) see high performance as increasing ease of movement, so they expect a positive relationship with turnover. However, the same theorists also predict that equitably rewarded high performance will lower the desirability of movement and, in turn, lower turnover. Steers and Mowday (1981) predicted that high performance will lead to increased expectations of rewards, which will lead to increased turnover if those expectations are not met. At the same time, their model predicts that low performance will diminish satisfaction with the intrinsic rewards of a job and hence increase turnover. Mobley (1982) captured the equivocality of present predictions well by stating that the possible organizational consequences of turnover include both the loss of good performers and the displacement of poor performers.

Disagreements among scholars who have reviewed previous empirical studies of the relationship between turnover and performance mirror the equivocality of the models. Some have concluded that the relationship is positive (Martin et al., 1981), some have concluded that it is negative (Keller, 1984; Sheridan, 1985), and most have concluded that it is unknown at present (Dreher, 1982; Mobley, 1982; Stumpf & Dawley, 1981). Representative of the third group is Jackofsky's observation that "to date, the inconsistencies in these findings have not been resolved" (1984: 75).

Hunter, Schmidt, and Jackson (1982) pointed out that differences in conclusions based on analyses of past research are quite common when qualitative literature reviews are used. They suggested that quantitative review techniques, more commonly called meta-analyses, be used whenever possible to help avoid such difficulties of interpretation. The purpose of this study was to determine quantitatively the present state of knowledge about the relationship between turnover and employees' performance. The outcomes of this study bear directly on the expected consequences of turnover, the likely explanatory power of models that include performance as a predictor, and the direction that future research should take.

METHODS

An extensive literature review employing both manual and computer searches (ABI/INFORM, PSYCH/INFO, and ERIC)[1] was undertaken. We consulted references in review articles and books concerning turnover as well as references in studies reporting relationships between performance and turnover. We examined all studies measuring both performance and turnover that surfaced in our search of the literature. To be included in the meta-analysis, studies had to report sample sizes and either correlation coefficients or t-statistics.[2] To avoid the problem of inadequate conceptualization of performance as a construct (Martin et al., 1981), we required studies to measure performance per se, not some proxy like education level, intelligence, or potential. Lastly, to avoid possible contamination of performance ratings, they had to have been made before employees left. Table 1 gives characteristics of the studies we analyzed.

Data were collected from 24 performance-to-turnover correlations—hereafter referred to as studies—contained in 18 research articles. The total number of respondents involved in the 24 studies was 7,717; the individuals held a wide variety of jobs. Sample sizes in individual studies ranged from 42 to 1,450 (median = 192). The time frames of the studies ranged from six months to 15 years (median = 1.7 years). Time spans from the measurement of performance to collection of turnover data ranged from six months to 5 years (median = 1 year). Thirteen studies included only voluntary turnover, 4 included only involuntary turnover, and 7 included both types. Average yearly turnover rates in the studies varied from 3 to 106 percent (median = 22%). The most frequent performance measure used was a summated rating

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[1] There are several ways to access these data bases. We used BRS Information Services, 1200 Route 7, Latham, New York 12110. ABI/INFORM, produced by Data Courier, includes primarily management and business-related publications. PSYCH/INFO is the online data base of *Psychological Abstracts*, produced by the American Psychological Association. ERIC is the Educational Resources Information Center data base, covering primarily education-related publications.

[2] We converted t-statistics to point biserial r's using the formula provided by Rosenthal and Rosnow (1984).

TABLE 1

Studies Correlating Performance and Turnover [a]

Studies	Subjects	Turnover Timeframe [b]	Measurement Timeframe [c]	Type of Turnover [d]	Mean Yearly Turnover Rate [e]	Measure of Performance [f]	r [g]
1. Bassett (1967)	199 exempt aerospace employees	1.0	1.0	T	24	GR supervisor	.12
2. Bluedorn & Abelson (1981)	158 clerical workers	1.0	1.0	V	22	GR supervisor	.03
3. Dreher (1982)	529 exempt electronics employees	15.0	≤1.0	T	4	GR supervisor	-.41**
4. Farris (1971)	203 pharmaceutical company scientists	5.0	5.0	T	3	GR knowledge-able judges	-.24*
5. Farris (1971)	192 electronics engineers	5.0	5.0	T	3	GR knowledge-able judges	-.03
6. Keller (1984)	190 manufacturing employees	1.0	1.0	V	15	SR supervisor	-.26**
7. LaRocco, Pugh, & Gunderson (1977)	543 navy enlisted personnel	1.7	?	V	51	SR supervisor	-.06
8. LaRocco, Pugh, & Gunderson (1977)	174 navy enlisted personnel	1.7	?	I	33	SR supervisor	-.45**
9. Leviatan (1978)	51 kibbutz production managers	≤8.0	?	T	?	SR subordinate	.05
10. Marsh & Mannari (1977)	748 Japanese electrical company employees	4.0	4.0	V	10	PI	-.14**
11. Martin, Price, & Mueller (1981)	162 registered nurses	?	?	V	?	SR supervisor	.13
12. Norris & Niebuhr (1984)	116 technical engineering department employees	?	?	T	?	SR supervisor	.09
13. O'Connor et al. (1984)	1,450 convenience store managers	1.5	1.5	T	20	SR supervisor	-.20***
14. Rosse (1986)	42 hospital housekeepers and nurses	0.5	0.5	V	100	GR supervisor	-.24
15. Sheridan (1985)	81 nursing home nurses	0.5	0.5	V	106	SR supervisor	-.27*

TABLE 1 (continued)

Studies	Subjects	Turnover Timeframe[b]	Measurement Timeframe[c]	Type of Turnover[d]	Mean Yearly Turnover Rate[e]	Measure of Performance[f]	r[g]
16. Sheridan & Vredenburgh (1979)	209 nurses and nurses' aides	1.0	0.8	V	19	SR supervisor	−.04
17. Spencer & Steers (1981)	295 hospital administrators and employees	1.0	≤1.0	V	18	SR supervisor	−.07
18. Stumpf & Dawley (1981)	189 bank tellers	6.0	?	V	8	GR supervisor	−.30**
19. Stumpf & Dawley (1981)	258 bank tellers	6.0	?	I	11	GR supervisor	−.36**
20. Stumpf & Dawley (1981)	188 bank tellers	2.0	?	V	24	GR supervisor	−.21**
21. Stumpf & Dawley (1981)	151 bank tellers	2.0	?	I	18	GR supervisor	−.66**
22. Stumpf & Hartman (1984)	85 business school graduates	0.7	0.7	V	28	SR self	−.20*
23. Wanous, Stumpf, & Bedrosian (1979)	777 small business new hires	0.6	<0.6	V	85	SR supervisor	−.34**
24. Wanous, Stumpf, & Bedrosian (1979)	727 small business new hires	0.6	<0.6	I	98	SR supervisor	−.38**

[a] ? = could not be determined from study.

[b] Figures represent number of years of turnover analyzed.

[c] Time in years from measurement of performance to measurement of turnover.

[d] V = Voluntary; I = Involuntary; T = Total

[e] Values are percentages.

[f] GR = global rating; SR = summated rating; PI = performance index combining performance ratings and attitudes.

[g] r's were either obtained directly from the study or calculated from a *t*-statistic given in the study.

* $p < .05$

** $p < .01$

*** $p < .001$

provided by a supervisor for research purposes (α = 0.77 to 0.99). In individual studies, correlations between performance and turnover varied from -0.66 to $+0.13$.

Once the studies were assembled, we applied the meta-analytic procedures suggested by Hunter and his colleagues (1982: 35–59) to the group of correlation coefficients. We made checks at several points in accordance with other quantitative cumulation procedures (Rosenthal & Rosnow, 1984).

There are four statistical artifacts that a meta-analysis can attempt to account for: sampling error, unreliability in the measurement of an independent variable, unreliability in the measurement of a dependent variable, and restriction of range. In the present study, lack of data prohibited making any corrections for the last two artifacts; inability to make these corrections is not a serious problem, however, because corrections for artifacts beyond sampling error generally account for very little additional variability in correlation coefficients in meta-analyses (Schmidt, Pearlman, Hunter, & Hirsch, 1985).

Correction for unreliability in the measurement of performance was made by using an estimate of the typical upper-bound interrater reliability coefficient of 0.60 for supervisory performance ratings (King, Hunter, & Schmidt, 1980). The distributions of reliability coefficients provided in the present group of studies was not used because coefficient alphas reflect little more than the degree of halo in the ratings.

Our meta-analysis therefore proceeded in four steps: (1) calculation of the sample size–weighted mean correlation and correlation variance across studies, including correction for sampling error; (2) correction of the mean correlation coefficient for attenuation in the measurement of performance; (3) examination of the confidence intervals about the corrected mean correlation coefficient and inspection of the percentage of variance explained by sampling error; and (4) a search for moderators, because sampling error variance accounted for only a small portion of the observed variation in correlations.

RESULTS

Table 2a presents the results of the overall meta-analysis on all studies included. The mean correlation coefficient for the relationship between performance and turnover in the 24 studies is -0.22. To check this overall conclusion, we applied Fisher's z transformation method of cumulating results across studies (Rosenthal & Rosnow, 1984: 377–379). The results were identical. Further, the overall finding is statistically significant at $p < .001$, if standard normal deviates (Zs), as suggested by Rosenthal and Rosnow (1984: 378), are used. Another way of assessing the strength of the finding is to calculate the so-called failsafe N—the number of new, unpublished, or unretrieved studies averaging null results that would be required to bring the overall results of the present study to barely significant (.05). Making that calculation addresses the file-drawer problem specified by Rosenthal (1979).

Using his formula, we determined the failsafe N to be 2,262 studies, indicating considerable stability in our overall findings.

Upon correction for attenuation in the performance measure, the overall mean correlation between turnover and performance rose to -0.28. Thus, extant research evidence indicates a significant negative relationship between the two variables: low turnover tends to occur among good performers, and high turnover tends to occur among poor performers.

The meta-analysis revealed, however, that the sampling error artifact accounts for only 11 percent of the variance in correlation coefficients across studies. Further, using two different statistical tests—a chi-square test (Hunter et al., 1982: 47) and a test for standard normal deviates (Rosenthal & Rosnow, 1984: 376)—we determined that the variation in r's across studies was statistically significant. Lastly, the 95 percent confidence interval for the mean correlation is large and encompasses zero (-0.68 to $+0.12$). Such circumstances warrant a search for potential moderators of the relationship between turnover and performance (Hunter et al., 1982).

Search for Moderators

Three potential substantive moderators and one methodological moderator were examined. In searching for substantive moderators, we used existing research and theory on turnover as guides in order to avoid capitalizing on chance.

Point biserial correlations. This moderator is not a substantive one, for it does not bear on theory concerning turnover but reflects a methodological concern in the application of meta-analysis to turnover research. Turnover is a dichotomization of the continuous variable called tenure. Most research on turnover uses point biserial correlations, which have a maximum value of less than one when the percentage split between leavers and stayers differs from 50–50. The more a split on the turnover variable varies from 50–50, the lower the upper bound for the point biserial correlation (Ghiselli, Campbell, & Zedeck, 1981). Therefore, point biserial r's in turnover research are always less than the corresponding Pearson r's would be on the underlying continuous variable of tenure. Further, when researchers cumulate point biserial r's across studies in a meta analysis, the differences in turnover rates, or the degree of departure from a 50–50 split on the dichotomous dependent variable, confounds the variation in correlations to an unknown degree. The issue here is one of comparability of point biserial correlation coefficients. The correlations obtained in studies where the split varies widely from 50–50 are not erroneous or fatally flawed; they are just not comparable to those obtained from even-split studies.[3] Prior cumulative turnover research, both qualitative and quantitative, has failed to deal directly with this issue.

In an attempt to estimate the magnitude of this potential confounding of results, we performed a moderator analysis on two subgroups drawn from

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[3] We are indebted to an anonymous reviewer who drew our attention to this point.

TABLE 2
Meta-Analytic Results for the Correlation Between Performance and Turnover

Analysis	N[a]	Total Sample Size	r[b]	r[c]	Variance in Sample Correlations	Variance Explained by Sampling Error Amount	%	Corrected s.d.[d]	95% Confidence Interval
(a) No Moderators									
Overall[e]	24	7,717	−.22	−.28	.0262	.0028	11	.20	−.68 to +.12
(b) With Distribution of Turnover as a Moderator									
Even split[f] (3, 8, 10, 14, 15, 18, 20, 23, 24)	9	3,455	−.31	−.40	.0107	.0021	20	.12	−.64 to −.16
Uneven split[f] (1, 2, 4–7, 13, 16, 17, 19, 21, 22)	12	3,933	−.16	−.21	.0228	.0029	13	.18	−.57 to +.15

[a] Number of studies.
[b] Sample size–weighted mean correlation coefficient.
[c] Correlation coefficient corrected for attenuation in the measurement of performance.
[d] Obtained by taking the square root of the difference between the total variance and the sampling error variance and dividing by the square root of the reliability estimate (.60) used to correct for attenuation.
[e] All studies listed in Table 1 were included in the analysis.
[f] The numbers in parentheses refer to the numbers of the studies listed in Table 1.

our overall group: (1) the nine studies in which the turnover rate among the employees studied was closest to 50 percent, with the range from 40 to 60 percent, and (2) the 12 studies that departed most from a 50 percent turnover rate, with the range 15 to 36 and 66 to 87 percent. Turnover rates could not be determined in three of the studies. Table 2b shows the results of this moderator analysis. As can be seen, the corrected mean correlation coefficient is about twice as large for the first subgroup (−0.40) as it is for the second (−0.21). Further, there is less nonartifactual variance in correlations in the first subgroup; in fact, the 95 percent confidence interval for the even-split subgroup does not encompass zero (−0.64 to −0.16). The relationship was unchanged when we modified the subgroup analyses by varying the end points of the ranges slightly, using 35 and 65 percent instead of 40 and 60 percent, or when we deleted studies concerning involuntary turnover.

Determining what is and what is not a moderator variable in meta-analysis is complex. The existence of a moderator in a meta-correlation suggests itself either in the form of substantial differences between mean r's for the subgroups, or in the reduction of nonartifactual variance in the subgroups, or both (Hunter et al., 1982). Table 2b shows that the variable assessing turnover splits meets the first test of a moderator—the mean r's are indeed substantially different. And, as expected, the point biserial r's appear to *understate* systematically the relationship between performance and turnover when turnover rates deviate widely from 50 percent. This finding suggests that the correlation obtained in the overall meta-analysis (r = −0.28) is probably not as large in a negative direction as the true mean correlation between performance and turnover.

However, the turnover-split variable only modestly reduces the amount of nonartifactual variance. The percent of variance explained by sampling error increases from 11 percent to 13 and 20 percent, and the corrected standard deviation decreases from 0.20 to 0.12 and 0.18. Thus, the variable does not meet both tests of being a moderator. Two interpretations of the analysis are possible. One is that the relationship between performance and turnover is always negative, because the moderator analysis shows that when only even-split studies—those that suffer less from artifactual depression of the observed r's—are examined, the 95 percent confidence interval for the population r does not encompass zero. The second interpretation, which we find more persuasive, is that the data do not entirely rule out the possibility that the relationship between performance and turnover may sometimes be positive. It does appear, however, that this positive relationship would never be large enough to be very meaningful.

The second interpretation is based on two observations. First, by chance, the three studies for which the turnover split could not be calculated—the three that had to be eliminated from the moderator analysis—were all studies that found positive correlations between performance and turnover (studies numbered 9, 11, and 12 in Table 1). Only five studies in the overall meta-analysis found positive r's. Therefore, reduction of the data set to perform the

moderator analysis resulted in the loss of 60 percent of the studies reporting a positive correlation. Those studies probably are not a random sample of all studies of performance and turnover, so eliminating them completely from the analysis may have biased the results. Because there is no objective basis for categorizing the studies in either the even- or uneven-split subgroup, our approach was to test all pertinent results to see how sensitive they were to the inclusion of the three studies in one or the other subgroup. We refer to such testing as sensitivity analysis.

For example, had the turnover splits been calculable for the three studies, their inclusion in either of the subgroup analyses in Table 2b would have resulted in reducing the mean r and increasing the observed nonartifactual variance. More specifically, if the three studies have even splits on the turn-over variable, the moderator analysis in Table 2b changes so that the corrected mean $r = -0.35$ (vs. -0.40), and the corrected standard deviation is 0.19 (vs. 0.12). The important cumulative effect of the two changes is that the 95 percent confidence interval for the population mean r now encompasses zero (-0.73 to $+0.03$), providing less assurance that the r is always negative.

The second observation that supports the possibility of a small (near zero) positive correlation between performance and turnover in some situations is that the variable of turnover splits does not meet the second test of a true moderator. The reduction of nonartifactual variance is so slight that there is considerable overlap between the 95 percent confidence intervals for the even-split (-0.64 to -0.16) and uneven-split subgroups (-0.57 to $+0.15$). Thus, we have little confidence that the observed difference in mean r's between the subgroups (-0.40 vs. -0.21) is in fact a true difference rather than one that occurred by chance.

Regardless of which of the two interpretations above is adopted, it is clear that other moderators must be considered because large unexplained variances, indicated by large corrected standard deviations, remain in either case. The importance of the above discussion is that if we adopt the first interpretation—that the relationship between performance and turnover is always negative—all subsequent moderator analyses are simply an attempt to narrow the range of possible negative correlations. If we adopt the second interpretation—that situations exist in which the performance-turnover rela-tionship is modestly positive—the moderator analyses are an attempt to both narrow the range of potential population correlations, and to discover the circumstances, if any, in which r might be zero or modestly positive.

Our demonstration of the potential confound of varying turnover splits suggested that all subsequent moderator analyses only be performed with comparable r's. As the correlations from studies with a 50–50 split on turn-over were more readily interpretable, we discuss only data from the even-split subgroup. However, for purposes of comparison, we also performed all moderator analyses using data from the uneven-split subgroup and the over-all group. Results of those analyses generally support the analysis that ap-pears below and increase confidence that the results are reasonably robust,

even though there were few studies in some subsets used in the moderator analyses.[4]

Type of turnover. The first substantive moderator considered was type of turnover. Jackofsky (1984) postulated a curvilinear relationship between performance and overall turnover. She argued that involuntary turnover was likely to be high among very poor performers, whom organizations were likely to push out, and voluntary turnover was likely to be high among the very best performers, who presumably would have good job opportunities elsewhere. If that hypothesis is correct, studies that measure total[5] turnover should yield little or no relationship between turnover and performance if (1) voluntary and involuntary turnover are on average approximately equally represented in total turnover and (2) the relationship is measured by a Pearson or point biserial correlation coefficient, both of which assume a linear relationship.

A direct test of Jackofsky's (1984) curvilinear relationship hypothesis requires data on performance and turnover for each individual in each study. Such data were, of course, unavailable for the present meta-analysis. However, we indirectly assessed the hypothesis by using type of turnover as a moderator. To be consistent with a curvilinear hypothesis, results from studies in the meta-analysis that involve only involuntary turnover should show a negative relationship between performance and turnover; those with only voluntary turnover should show a positive relationship; and those with total turnover should show no, or a near-zero, relationship. The first three lines in Table 3 provide the data related to this hypothesis. A negative relationship with performance is indeed evident in studies that examined only involuntary turnover (mean $r = -0.51$). Further, all the variance in the correlations in the two studies in this subset is attributable to sampling error, suggesting that the relationship between performance and involuntary turnover is always negative. However, this conclusion must be interpreted cautiously. As have others (e.g., Schmitt, Gooding, Noe, & Kirsch, 1984), we have found in our meta-analytic work that all variance is frequently attributable to sampling error when the number of studies in a sample is small.

The analyses of voluntary turnover and total turnover are less straight forward and are complicated by the fact that the subset of r's for total turnover consists of a single study. Consideration of only the data in Table 3 suggests that the required positive relationship between performance and voluntary turnover and the required lack of a relationship between performance and total turnover are not evident. In fact, both relationships are

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[4] Space limitations prohibit the presentation and discussion of those results, but interested readers can obtain them by writing to the first author.

[5] We use the term *total* turnover to refer to a study in which no mention is made of whether turnover is voluntary or involuntary. Hence, total turnover most likely includes some unspecifiable amount of both types of turnover. There is no a priori reason to believe that turnover in such studies is, on average, either predominantly voluntary or predominantly involuntary.

TABLE 3
Three Substantive Moderator Analyses
for the Correlation Between Performance and Turnover

Moderators [a]	N [b]	Total Sample Size	r [c]	r [d]	Variance in Sample Correlations	Variance Explained by Sampling Error		Corrected s.d. [e]	95% Confidence Interval
						Amount	%		
Type of turnover									
Involuntary turnover (8,24)	2	901	-.39	-.51	.0008	.0016	100	.00	
Voluntary turnover (10,14,15,18,20, 23)	6	2,025	-.24	-.31	.0080	.0026	33	.09	-.49 to -.13
Total turnover (3)	1	529	-.41	-.53					
Measurement time span									
Shorter time span (3,14,15,23)	4	1,429	-.36	-.46	.0020	.0021	100	.00	
Longer time span (10)	1	748	-.14	-.18					
Unemployment rate									
Above-average unemployment (14,15,23)	3	900	-.33	-.43	.0008	.0026	100	.00	
Below-average unemployment (20)	1	188	-.21	-.27					

[a] The numbers in parentheses refer to the numbers of the studies listed in Table 1.
[b] Number of studies.
[c] Sample size–weighted mean correlation coefficient.
[d] Correlation coefficient corrected for attenuation in the measurement of performance.
[e] Obtained by taking the square root of the difference between the total variance and the sampling error variance, and dividing by the square root of the reliability estimate (.60) used to correct for attenuation.

negative (mean r's −0.31 and −0.53). Further, nonartifactual variance has been reduced substantially. However, the presence of only a single study in the subset causes problems of interpretability.

Additional interpretability problems surfaced when we carried out a sensitivity analysis. Study number 11 in Table 1 assessed voluntary turnover; studies 9 and 12, total turnover. If study number 11 has an even split on the turnover variable and is included with the data in the second line in Table 3, the results change enough to make a difference. The mean r drops only slightly, to −0.28, but the variance explained by sampling error drops to 17 percent, and the confidence interval expands to include zero (−0.58 to +0.03). Even more dramatic changes occur when the studies numbered 9 and 12 are included in the total turnover data. The mean r drops to −0.37, only 8 percent of the variance is explained by sampling error, and the confidence interval is −0.89 to +0.15. Thus, although the results do not support the curvilinear hypothesis for the studies of voluntary and total turnover, neither can they completely disconfirm the possible existence of such a relationship.

Overall, the results of the moderator analysis suggest that although the relationship between performance and involuntary turnover is always negative, a slightly positive relationship between performance and either voluntary or total turnover cannot be ruled out. Since studies of involuntary turnover demonstrated a significantly different relationship between performance and turnover than did studies assessing voluntary and total turnover, we performed all subsequent moderator analyses with the four studies of involuntary turnover (numbers 8, 19, 21, and 24 in Table 1) removed from the sample.

Time span of measurement. The third moderator we considered was the length of time from the measurement of performance to the measurement of turnover. If declining performance is a precursor to turnover, as the previous analyses suggest, the effects may be noticeable only if the measurements of performance and turnover are temporally close. In fact, support for similar temporal dynamics has emerged in research on turnover that assessed dissatisfaction (Youngblood, Mobley, & Meglino, 1983) and intentions to quit (Steele & Ovalle, 1984). Therefore, we expected that more highly negative relationships would emerge for studies with short intervals between the measurement of the two variables.

In testing this hypothesis, we eliminated 9 studies because they did not provide enough information to allow a calculation of the approximate time span from measurement of performance to turnover. For the studies that remained, the median time span was one year; this median served as the cutoff between long and short time spans. Three studies fell exactly on the median, and a fourth involved only involuntary turnover; we deleted these 4 studies from the analysis as well. Of the 11 studies that remained, 5 were nearly even in their splits on the turnover variable. The fourth and fifth lines in Table 3 present the results of the analysis with these 5 studies.

As can be seen, the studies with short time spans did indeed show a more negative relationship between turnover and performance than did those with long time spans (mean r = −0.46 vs. mean r = −0.18). Further, sampling error accounted for all the remaining variability. The same proviso applies here as in the discussion of types of turnover, however: the number of studies in each subgroup is so small that this result must be interpreted with caution.

Unemployment rate. A fourth moderator considered was unemployment rate. Several authors have argued that research on turnover needs to pay more attention to conditions in the job market (March & Simon, 1958; Mobley, 1982; Steele & Ovalle, 1984). Aggregate analysis of the economy as a whole has consistently shown a strong inverse relation (r = −0.84) between unemployment and turnover rates (Mobley, 1982: 83). Further, the relationship between turnover and performance may vary systematically with the availability of job alternatives. In particular, poor performers may be more likely to leave when jobs are plentiful. Keller (1984), for example, in discussing the −0.26 correlation he discovered between turnover and performance, suggested that because the job market was good during the time of his study, poor performers might have been able to leave their jobs readily.

To examine the moderator of unemployment rate, we reviewed the studies in Table 1 to determine the dates the research actually took place. Roughly half of the studies gave such dates. For the other half, we estimated the dates of the research using the following method. In the social sciences, the average length of time from completion of a research project to publication is 28 months (Zammuto & Connolly, 1984). We estimated that, on the average, writing up a study consumes another two months. Therefore, it appeared that the average time from the collection of turnover data—usually the last step in a research process—to the appearance of an article in print was 30 months. Our estimate compared favorably to the time spans for those studies that did report exact research dates. Thus, we assumed all studies whose authors did not give precise research dates to have been completed 30 months before their date of publication. All studies were moved backward in time an additional six months to approximate the midpoint of the research because, as Table 2 shows, the median time span from performance measurement to turnover measurement is one year.

Unemployment data were then obtained for these periods (Council of Economic Advisors, 1984: 259). We created two groups, one for studies that occurred during time of above-average unemployment, and one for those from times of below-average unemployment. The median unemployment rate was 7.1 percent. We deleted studies with uneven turnover splits. Results, which appear in the last two lines of Table 3, are contrary to expectations. When jobs are scarce, the performance-turnover relationship is more negative (mean r = −0.43) than when jobs are plentiful (mean r = −0.27). Again, all remaining variability is attributable to sampling error, and again the result must be interpreted cautiously because there are very few studies in

each subset. Sensitivity analysis is necessary for the below-average unemployment subset because study number 11 in Table 1 falls into that caregory. If we include this study with the data on the last line of Table 3, the mean r drops to −0.06, the variance attributable to sampling error is 20 percent, and the confidence interval encompasses zero (−0.46 to +0.34). Thus, we cannot rule out the possibility of a positive correlation between performance and turnover when jobs are plentiful. Further, since this last confidence interval encompasses −0.43, we cannot be certain that true differences actually exist in the correlation between performance and turnover for the below- and above-average unemployment subsets.

DISCUSSION

Our quantitative cumulation of 24 studies indicated that good performers are significantly less likely to leave an organization than are poor performers. This overall outcome of the meta-analysis should help remove some of the equivocality in present turnover models regarding the expected direction of the relationship between turnover and performance. As we noted in the introduction, some models predict that good performance will increase ease of movement and will therefore lead to a positive performance-turnover relationship. Other models do not postulate such a linkage and in fact suggest a negative performance-turnover relationship. The present research provided more support for the latter models than for the former.

At least two theoretical reasons can be advanced to account for the discovery of a significant, negative overall relationship between performance and turnover. First, receiving a low or below-average performance rating is likely to be a stressful event, and recent research indicates that individuals under stress will engage in more information search activities than other individuals (Keller, 1984). Thus, poor performers may engage in many job search activities.

Second, with the exception of the considerations surrounding ease of movement we have discussed, recent formulations of turnover models that have incorporated performance have been consistent with each other. All have postulated a causal chain from performance to satisfaction to intentions to leave to turnover. Although the perceived equitability of rewards may moderate it, the relationship of performance to satisfaction is generally positive, as is the relationship of intentions to leave to subsequent turnover. On the other hand, satisfaction and intent to leave, or satisfaction and turnover, are generally related negatively. A substantial body of previous research (Petty, McGee, & Cavender, 1984; Steele & Ovalle, 1984) supports each of these individual linkages. In theory, therefore, there is good reason to believe that performance and turnover should be related negatively; it is the only direction of the relationship consistent with previous research and most current turnover models, if we delete the linkage of performance to ease of movement.

The present study found some support for type of turnover as a moderator of the overall relationship of performance and turnover and simultaneously failed to disconfirm completely the existence of a curvilinear relationship between performance and total turnover. All three forms of turnover—voluntary, involuntary, and total—were related negatively to performance, but involuntary turnover had the highest interpretable negative relationship and was the only form for which sensitivity analysis did not rule out the possibility of a slight positive relationship.

Our search of the literature yielded only three other studies that tested for a curvilinear relationship between performance and turnover (Bluedorn & Abelson, 1981; Jackofsky et al., 1986; Wagner, Pfeffer, & O'Reilly, 1984). Two of the three failed to find such a relationship. The idea of curvilinear relationship rests on the premise that high performance leads to increased ease of movement. It appears that more research on voluntary turnover is needed to resolve the curvilinearity issue. Such research must be careful to measure voluntary turnover in such a way as to minimize the possibility that the construct also captures some involuntary turnover. Several authors have noted the difficulty of separating organizationally encouraged voluntary turnover from truly volitional turnover (Jackofsky, 1984; McEvoy & Cascio, 1985).

The present research found some support for a moderating effect for time span between measurements of performance and turnover. This finding offers a promising avenue for future longitudinal research. A reasonable tentative hypothesis is that there is no relationship or only a very weak relationship between performance and voluntary turnover when performance is measured before employees decide to leave. After such a decision, performance may decline significantly, strengthening the negative relationship between turnover and performance. Such temporal dynamics have been found for satisfaction and behavioral intentions as predictors of turnover. Further, such a notion is consistent with a catastrophe model of turnover, which postulates that the transition from retention to turnover is discontinuous (Sheridan, 1985).

This study found only modest support for unemployment rate as a moderator, and its effect was opposite to the direction anticipated. In light of prior theorizing, we expected the relationship between performance and turnover to be strongly negative when jobs were plentiful; the notion was that good performers can find jobs anytime, but poor performers have to wait for a thriving job market. In fact, just the opposite may occur: either good performers leave in greater proportions than usual when the job market improves, or poor performers leave in greater proportions than usual when the job market worsens. The second dynamic may be a function of the fact that total turnover, as we defined it, includes some involuntary turnover, and such organizationally-induced turnover during economic downturns may be concentrated among poor performers. However, more research is needed to determine the usefulness of unemployment rate for understanding the process of turnover. Its effects are likely to be stronger if a measure of local, rather than national, job availability is used. Therefore, for the purposes of

future meta-analyses, it would be helpful if authors would publish some indication of local job market conditions at the time of their studies.

The methodological moderator of distribution on the dichotomous turnover variable raises some disturbing questions about the effects of comparing observed point biserial correlations across studies. The magnitude of the difference in corrected correlation coefficients between even and uneven splits (-0.40 vs. -0.21) is rather striking (0.19). In fact, this difference is almost as large as the actual value of the meta-correlation found for uneven-split data (-0.21), suggesting that a nearly twofold bias may be present in published studies owing to differences in samples' distributions on the turnover variable. Thus, at least some of the variations in findings reported in the literature may be statistical artifacts of different turnover splits. Such a possibility may surface in any literature review process—quantitative or qualitative. Readers of all studies of turnover and reviews of such studies should be alert to the possible contamination of results by this statistical artifact.

Indeed, the methodological implications for meta-analysis extend beyond studies of turnover. Whenever the distribution of a criterion variable deviates substantially from a normal distribution, it is possible that differences in results across studies may be partially attributable to distribution differences. For example, in research on absenteeism, where the dependent variable is often skewed severely, any meta-analysis must be sensitive to the possibility that differences across studies may be due in part to this artifact. We caution other researchers who use meta-analytic procedures to be aware of the potential confounding that occurs when dependent variables differ widely in the shapes of their distributions.

The mean correlation of -0.28 between performance and turnover found in this meta-analysis places job performance close in explanatory power to other independent variables that have received much more attention in turnover research. For example, Steele and Ovalle (1984) found mean correlations between turnover and job satisfaction, organizational commitment, and behavioral intentions to be -0.28, -0.38, and $+0.50$, respectively. Our results suggest that the newer formulations of turnover models that have incorporated performance as an independent variable should improve understanding and prediction of the phenomenon.

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RETROSPECTIVE ACCOUNTS
OF RESEARCH FACTORS ASSOCIATED
WITH SIGNIFICANT AND NOT-SO-SIGNIFICANT
RESEARCH OUTCOMES

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Three models with the potential to explain significant organizational research outcomes are described and evaluated. One model focuses on antecedent conditions, another on research processes, and the third on characteristics of research outcomes. Fifty-six organizational scholars reported about one of their significant and one of their not-so-significant research projects. Significance was operationally defined by ten attributes, including citations, awards, and positive responses from other researchers. The retrospective data identified several reported factors that occurred prior to and during research projects that were related to research outcomes. The model dealing with the research process itself differentiated significant from not-so-significant research better than either of the other models.

How do organizational scholars become engaged in significant research? Why do some research projects yield innovative and significant increments to knowledge, and others yield outcomes that seem dull and routine? These questions are difficult to answer. Significant research may be an outcome of investigators' creativity (Vessels, 1982), family background (Berry, 1981), research productivity (Jauch & Glueck, 1975), institutional context (Glueck & Deich, 1972; Lambright & Teich, 1981; Manis, 1951), or chance opportunity (Campbell, Daft, & Hulin, 1982). Some questions about significant research may not be analyzable; how projects originate in the intuitive and idiosyncratic cognitive processes of investigators is one such question. Whatever the explanation, differences in the innovativeness and significance of research do exist, and journal referees and other scholars recognize those differences (Gottfredson, 1978).

The research in this paper was undertaken to explore the antecedents and activities associated with significant and not-so-significant organizational research. We sought to accomplish two goals. First, we used retrospective data to assess alternative theoretical explanations of the research process. Systematic research has become a widespread phenomenon in our society— business firms, universities, government agencies, and R & D organizations

all undertake research projects (Pelz & Andrews, 1976). A stream of research devoted to the self-reflective understanding of research activities and processes exists (Andrews, 1979). That literature is the source of the underlying ideas from which we developed three theoretical models to focus our research inquiry. The models identify bases for differentiating significant from nonsignificant research. We used the findings that emerge from analyses of the three models to refine our theoretical understanding of organizational research.

The second goal for this research pertained to practical outcomes for organizational researchers. When they make choices about which research projects to undertake and which to ignore, scholars weigh the potential significance and publishability of research outcomes. After a project is completed, others continue to be concerned with its significance—journal referees, journal editors, promotion and tenure committees, the researchers' colleagues, and other scholars doing research on the same topic (Cummings & Frost, 1985). Such evaluations come after the fact, when it is too late to alter the research to enhance its potential. Researchers could use new theoretical knowledge about factors associated with the beginning stages of significant research to choose projects with a greater likelihood for innovative outcomes.

REASONS FOR SIGNIFICANCE

Significance is a nebulous construct to define and measure. In some ways the concept of research significance is similar to the concept of organizational effectiveness. Organizational effectiveness is multidimensional and cannot be measured by an absolute standard. Contemporary approaches to organizational effectiveness have resolved those problems by evaluating effectiveness from multiple perspectives, each representing a distinct dimension of effectiveness and sometimes competing values about what organizational effectiveness should be (Connolly, Conlon, & Deutsch, 1980; Daft, 1986; Quinn & Rohrbaugh, 1983). There is no absolute criterion in the literature that can be used to differentiate effective from not-so-effective organizations.

The approach taken here was to define research outcomes as having multiple dimensions that can be jointly used to evaluate significance. Moreover, we saw significance as a matter of degree rather than as an attribute that is clearly present or absent in a piece of research. Our focus, then, was on the extent to which several indicators of significance were perceived to be present in a piece of research. Not-so-significant research would have fewer of those indicators than would significant research.

Investigations into the reasons for significant research outcomes have typically followed two paths. One approach has been to study the personal characteristics of individual scientists. Research into the social background of Nobel Prize–winning scientists, for example, has revealed that they tend to come from upwardly mobile professional or business families (Berry, 1981;

Silver, 1983) and are thus influenced early in their life by models of parental achievement. Nobel Prize winners in literature, by contrast, are likely to come from poor families with low social status. Other research has indicated that people who produce creative research have high levels of characteristics typically associated with creative people. Those characteristics include openness to surroundings, self-esteem, fluency, curiosity, independence, autonomy (Stein, 1982; Vessels, 1982), right-left brain integration (Meyers, 1982), and characteristics such as effectance motivation, cognitive complexity, and deductive-analytical ability (Pearlman, 1983).

The other approach toward explaining research significance has been to examine contextual factors that impinge on research and publication processes. Factors that have been studied include the incentives available to a researcher for undertaking a research project (Campbell et al., 1982), the procedures used in research (Gottfredson, 1978), the source of research ideas (Jauch & Glueck, 1975), and the extent of paradigm development within a research discipline (Beyer, 1978; Lodahl & Gordon, 1972; McKinley, Cheng, & Schick, 1986; Pfeffer, Leong, & Strehl, 1977). Other variables pertain to the nature of a research problem, such as the extent to which it is applied or theoretical (Campbell et al., 1982; Gottfredson, 1978) and the extent to which the idea produces unexpected variations in the understanding of traditional concepts (Davis, 1971; Moynihan & Mehrabian, 1981).

The present study investigated the context of research rather than individual differences among researchers. Such differences are important but are beyond researchers' control. Learning about the personality of prominent scientists can help explain scientific achievements but will not help other researchers learn to identify important problems or adopt behavior patterns that will increase the significance of their own work.

The literature suggested three models of research context, each pertaining to a different stage of the research process. We designated them the Davis model, the antecedents model, and the ambidextrous model. The models provide a theoretical basis for exploring research context while partially controlling for differences in creativity and cognitive characteristics of investigators.

The Davis Model

Davis (1971) proposed that sociological contributions were considered significant because they were "interesting." Davis argued that the impact and significance of a theory had little to do with the empirical procedures used or the theory's verifiability or relationship to absolute truth. Indeed, he argued that easily verifiable ideas are soon forgotten and that publications are considered great simply because the work is interesting. He defined interesting work as having the quality of denying some assumptions of the audience. If a theory denies no assumptions, it will be seen as obvious, as restating old ideas. If it denies all assumptions, however, people will see it as unbelievable or irrelevant. A theory must be in the middle with respect to

audience assumptions and must differ modestly from those assumptions in order to surprise and intrigue.

Davis identified 12 characteristics of sociological theories that were related to significance and impact in the sociological literature. Those characteristics, summarized in Table 1, are also applicable to the outcomes of organizational research. An important implication that can be drawn from the Davis model is that an investigator's motivation, creativity, and procedures are not the primary determinants of significance. Research is significant simply because its outcome convincingly denies assumptions on the part of the audience, which therefore considers the findings novel and interesting. Thus, one research question of interest to us was the extent to which significant organizational research possesses one or more of the characteristics Davis identified.

The specific examples of significant research that Davis (1971) provided to illustrate the 12 categories give partial support for an affirmative answer to that question. Other research that has evaluated research outcomes has found that the perceived quality of published research is positively associated with

TABLE 1
Characteristics of Significant Research
in the Davis Model [a]

Characteristics	Summaries
Organization	What seems to be a disorganized and unstructured phenomenon is in reality a well-structured phenomenon, or vice versa.
Composition	What seem to be heterogeneous phenomena are actually composed of a single element, or vice versa.
Abstraction	What seems to be an individual-level phenomenon is in reality a social system phenomenon, or vice versa.
Generalization	What seems to be a local phenomenon is in reality a general phenomenon, or vice versa.
Stabilization	What seems to be a stable and unchanging phenomenon is in reality and unstable and changing phenomenon, or vice versa.
Function	What seems to be a phenomenon that functions ineffectively as a means for attainment of an end is in reality a phenomenon that functions effectively, or vice versa.
Evaluation	What seems to be a bad phenomenon is in reality a good phenomenon, or vice versa.
Co-relation	What seem to be independent phenomena are in reality correlated phenomena, or vice versa.
Coexistence	What seem to be phenomena that can exist together are in reality phenomena that cannot exist together, or vice versa.
Covariation	What seems to be a positive covariation between phenomena is in reality a negative covariation between phenomena, or vice versa.
Opposition	What seem to be nearly identical phenomena are in reality opposite phenomena, or vice versa.
Causation	What seems to be the independent variable in a causal relation is in reality the dependent variable.

[a] Characteristics are derived from Davis (1971).

originality and with advancing knowledge in a field and is negatively associated with routine, trivial problems, routine data-grinding, and research of little interest (Gottfredson, 1978).

The Antecedents Model

The antecedents model is concerned with the beginnings of research projects, a perspective that contrasts with the Davis model's focus on the final products of research. In the antecedents model, conditions at the beginning of research are the source of significance. The early work of Manis (1951) and of Pelz and Andrews (1976) shapes the perspective, which also draws on more recent findings by Campbell and his colleagues (1982) and Gottfredson (1978). The argument is that initial factors determine whether a research question is likely to lead to significant outcomes. Those factors include conditions within an investigator's institution, the interpersonal contacts that spark a research question, the incentives motivating a researcher to undertake a project, and the goal of the research as perceived by an investigator. The literature does not explicitly state what antecedents lead to significance, but research findings do suggest five trends that we integrated into the antecedents model.

One trend is supportive institutional conditions, including resources and research grants (Andrews, 1979; Manis, 1951), institutional size and research eminence, adequate physical facilities, and an internal climate that supports research productivity (Manis, 1951; Pelz & Andrews, 1976). Positive institutional conditions enable and reinforce behavior that leads to significant research outcomes. Financial grants, research assistance, and a supportive climate all enable a researcher to pursue ideas without having to use up energy in activities concerned with basic resource acquisition and maintenance.

A second trend implicit in the antecedents model is that significant ideas converge from several sources rather than deriving from a single source. The argument is that good research begins from diversity and the linking together of different lines of thought that are combined in novel and nonlinear ways. Pelz and Andrews (1976) recognized the role of diversity among scientists. Investigators surveyed in another study (Campbell et al., 1982) reported that good projects often started as the chance convergence of a research idea with exposure to a new method and, perhaps, access to a research site. Research that begins with a single source—such as responding to a journal article or answering the next logical question in a traditional research stream—tends to produce outcomes that are less significant.

A third element of the antecedents model is the extent to which a research project is theory- or method-based. Campbell and coauthors (1982) found that when investigators undertaking a project sought a theoretical explanation, the research outcome tended to be perceived as more significant. Many studies that they investigated, however, originated for nontheoretical reasons, such as the availability of a data base or the desire to apply a new research technique. Those projects did not focus on theoretical understanding,

and the outcomes were perceived as less significant. Research designed to simply exploit or grind data also tended to be perceived as less significant (Gottfredson, 1978).

Fourth, the antecedents model suggests that significant research begins with a research question that is relevant. Campbell and his colleagues found that studies undertaken to solve a problem that was considered of high priority within a discipline tended to be perceived as more significant. Manis (1951) found that research undertaken to test academic theory tended to be more relevant than research not designed to test theory. Gottfredson (1978) found that research characterized as failing to answer the "who cares" or "so what" questions produced outcomes of low quality. One aspect of relevance is that a project has roots in the practical world as well as the academic world. A number of significant studies explored by Campbell and colleagues began with the desire to solve a real-world problem. The solution to the real-world problem was accomplished in a way that revealed new theoretical knowledge about organizations.

Finally, the antecedents model suggests that significant research begins with the goal of making a contribution to knowledge rather than of providing short-term returns to the investigator. In the Campbell et al. (1982) study, several respondents reported undertaking a study for reasons of short-term expedience, including opportunities to get a quick publication or to earn money through a research contract, an obligation to fulfill a research contract, and a desire for promotion and tenure. When expedient goals were identified, research tended to be less significant. When investigators' goals were to make a theoretical contribution to the study of organizations and did not include short-term expedience, research rated high in significance tended to emerge.

To briefly summarize, antecedents to significant research should include positive institutional conditions, diverse sources of ideas, widespread communication, a focus on theoretical understanding, a relevant research problem, and a goal of contributing to knowledge. The antecedents model suggests that these factors will be associated with the ultimate significance of final research outcomes.

The Ambidextrous Model

The ambidextrous model deals with research activities that fit between the Davis model, which focuses on final research products, and the antecedents model, which focuses on research beginnings. The term "ambidextrous" originally was used by Duncan (1976) to describe innovative organizations. Ambidextrous organizations can sequentially use organic and mechanistic structures to foster both the initiation and implementation of innovations (McDonough & Leifer, 1983). The ambidextrous model can also be applied to the procedures and processes used to conduct academic research. For example, on the basis of their data, Campbell and his colleagues (1982) proposed that the research process can be characterized by a duality that

includes both organic and mechanistic conditions. They reported that research beginnings were often characterized by uncertainty and lack of clarity. Investigators became involved through spontaneous, intuitive choices rather than through well-defined, logical decisions about clear research problems. The research process transformed such organic beginnings into mechanistic endings. The final outcomes were often well-defined models or sets of findings, empirically rigorous and precise, that produced publishable articles or books. Investigators started under equivocal, uncertain conditions with unclear problems and used the research project to achieve outcomes that were specific and precise.

Campbell and coauthors noted that research projects that did not have organic properties at the beginning and mechanistic properties at the end tended to produce less significant research outcomes. Investigators might deviate from the ambidextrous model in two ways. First, they sometimes chose a topic that had already been well defined by their own or others' previous research. The use of mechanistic processes at the beginning of a project tended to lead investigators down paths that were less significant. Second, final outcomes that were fuzzy, unclear, and organic also tended to mean insignificant findings. Manuscripts that are unclear, data that do not test a research question, misrepresentation of other viewpoints in a literature, inexact or unclear conclusions, and a general lack of theoretical understanding all betoken organic outcomes (Gottfredson, 1978). Thus, the relevant question for the present research was whether significant research began organically and finished mechanistically, thereby displaying investigators' use of both organic and mechanistic processes during the research process.

Campbell and his colleagues identified a second aspect of the process of transformation from equivocality to clarity. The amount of personal involvement, energy, and commitment displayed by investigators was greater for significant research. Reducing equivocality takes hard work; investigating a routine problem to produce a routine outcome is comparatively easy. Transforming a messy beginning into a well-defined ending requires strong commitment. Bringing a fuzzy idea into focus and developing the appropriate research methods to test a new idea in a reasonably precise way represent difficult intellectual achievements. Thus, the second research question concerning the ambidextrous model was whether greater commitment and energy on the part of investigators is associated with significant research outcomes.

METHODS

Data Sources

A major issue in the design of this research was controlling for the effects of personal ability. On the average, highly capable scholars, those with much ability, should produce significant research outcomes, and less capable scholars, with less ability, should produce less significant outcomes. The confounding effect of personal ability was a threat to the validity of

inferences about the role of antecedent conditions or research activities on research outcomes.

Our solution was to compare research projects for individual investigators rather than across investigators. Campbell and his colleagues interviewed several established scholars and found that each one had conducted several research projects. Some projects had been quite successful and were, in fact, the bulwarks of the scholars' reputations, but others had not been very significant. Thus, we decided to interview established scholars about two projects, one that they considered significant and one they considered not-so-significant. Since the same person had directed both projects, the effects of personal ability would be at least partially controlled.

The initial group of researchers contacted consisted of 132 members of editorial review boards who had served on either the *Academy of Management Journal* or the *Administrative Science Quarterly* during a recent six-year period. Both journals publish mainstream organizational science research. Our choice of members of editorial review boards was based on the assumption that those individuals had done research, were recognized as capable scholars, and had produced research outcomes in both the significant and not-so-significant categories. The research outcomes about which we asked respondents could have appeared in any journal or in a book. The final set of respondents represented an almost equal distribution of organizational scholars concerned with micro and with macro levels of investigation.

Procedures

The editorial review-board members were initially contacted by letter. Although the primary purpose of the letter was to introduce the study and invite participation, it also described what would be involved. Participation required individuals to complete two interview-questionnaire forms—one each for a significant and a not-so-significant research project they had undertaken. Although the questionnaire contained primarily closed-ended questions that could be completed in 25 minutes, there were also several open-ended questions. Respondents could answer the open-ended questions either in writing or over the telephone. The letter requested board members to return a self-addressed, postage-paid card indicating whether they would participate in the study.

The interview-questionnaire forms were mailed within two weeks of the receipt of a postcard. A letter reiterating several of the issues discussed in the initial letter accompanied the questionnaires. General guidelines and a list of suggested criteria for evaluating the significance of research were also included. The criteria were those used by Campbell and his colleagues (1982). We chose to use them because of that earlier use and because of their face validity. The general guidelines stated:

> From the pool of research projects in which you have participated,
> please select two that can be contrasted in terms of significance.
> The significance criteria you use is up to you (e.g., collegial
> response vs. citations vs. awards). Our only requirement is that
> the two projects you select rank differently on significance.

As a general guideline, we would like for both pieces of research
to have been completed and submitted for publication to jour-
nals generally known and available to organizational scientists.

The suggested criteria for significant research were:

Favorable response by colleagues

Favorable response by reviewers

Cited by others (academic research and/or textbooks)

Reprint requests

Nominated for or winner of award(s)

Generated positive feedback from readers

Recognized as making a contribution to the field

Basis for research by others

Perceived as novel, creative, or insightful by others

Practical applications through consulting or business adoption

The criteria for not-so-significant research were:

Unfavorable or negative response by colleagues

Unfavorable or negative response by reviewers

Seldom or never cited

Few or no reprint requests

Received little or no recognition

Published in a low-level journal or rejected

Even though published, the research had little, if any, impact on
academic research or business thinking

Published and never heard from again

We provided self-addressed, postage-paid envelopes for returning the ques-
tionnaires and asked that respondents send a reprint or other reference copy
of both works along with the forms.

After several weeks, we sent a follow-up letter and questionnaires to
editorial board members who had not yet responded. The two mailings
resulted in a final set of 56 pairs of responses, a 42 percent rate of response.
Although some data were missing, the final set of responses provided fairly
complete and detailed information.

A comment on the validity issues associated with retrospective recall by
single informants seems appropriate. Retrospective recall has been criti-
cized on the grounds that it provides distorted or contaminated data. Huber
and Power (1985) noted weaknesses in such an approach and suggested
guidelines for improving the accuracy of retrospective data from informants.
Bias is a particular problem when an individual does not have access to
information or has low motivation to participate, or when questions are
unclear. We took several steps to minimize those problems. The respondents
were free not to participate, and those who did participate committed them-
selves by returning postcards before they actually began their involvement.
Respondents were the best sources of information about the research pro-
jects they agreed to describe. Moreover, we assessed our theories using only
data from closed-ended questions that had been found to be clear and under-
standable through pilot testing.

Another step to limit bias was to depersonalize questions as much as possible. Following the procedure outlined by Schneider and Locke (1971), we classified items as attributable to "self" or to "not self." The final version of the instrument contained almost equal numbers of the two types of items, thus minimizing the potential for social approval effects. Additional information about the validity of the data appears under the Measures and Analyses sections.

Publication Characteristics

The research outcomes selected by respondents consisted of 80 journal articles and 18 books. Of the significant research projects, 13 resulted in the publication of a book, and 4 in both a book and an article. The results of all the projects deemed significant appeared in widely recognized academic outlets. The *Administrative Science Quarterly* published 12 of the articles; the *American Sociological Review*, 6; the *Academy of Management Journal*, 5; the *Journal of Applied Psychology*, 3; the *Harvard Business Review*, 3; the *Academy of Management Review*, 3; and *Organizational Behavior and Human Performance*, 2. For the not-so-significant research outcomes, 14 were not published in recognized academic outlets but were issued as working papers or as technical reports or were presented at meetings and published in their proceedings. The *Journal of Applied Psychology* published 5 articles deemed not-so-significant; the *Administrative Science Quarterly*, 4; the *Academy of Management Journal*, 3; and the *Harvard Business Review*, 2. The remainder of the articles were published in a variety of journals both within and outside the organizational sciences area, and 5 of the not-so-significant research projects led to books.

The classification of research topics reflected both micro and macro levels of investigation. Respondents classified the projects as pertaining to the following areas: organizational behavior, 32; organization theory, 21; industrial and organizational psychology, 13; sociology, 13; policy, 5; personnel, 4; multiple, 11; and other, 10.

Measures

The interview-questionnaire form was developed by using Campbell and colleagues' (1982) measures as a starting point. Specifically, the instrument contained a variety of open- and closed-ended questions that could measure various aspects of the Davis, antecedents, and ambidextrous models. We developed a number of Likert-type items to explore the accuracy of the three models. In light of the exploratory nature of the research as well as the lack of instrumentation to measure relevant concepts, we can say little about the construct or predictive validity of the scales. However, we took care to maximize the face validity of the items and also carefully considered social approval effects. We pretested items for clarity and revised them as needed to ensure accurate understanding.[1]

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[1]Questions asked are presented in the tables in abbreviated form. Full versions of them are available from the first author.

Relative Significance

The study design provided an assessment of relative significance for each research project. Each respondent selected two projects that differed in terms of significance. To determine how respondents assessed relative significance, we included ten criteria of significance in the questionnaire. Table 2 shows the items and their means, standard deviations, and values for t. Results for all 10 items are significantly different beyond the .001 level. The findings shown in Table 2 indicate that the respondents saw clear and consistent differences in the projects along academic criteria typically associated with significant and not-so-significant research outcomes.

In an effort to cross-validate the respondents' assessments of the relative significance of their work, we obtained independent assessments of significance from a panel. The analysis was limited to those respondents who published both pieces of research as articles. We randomly selected ten names among those respondents and obtained copies of both articles. Next we created a panel of five doctoral students familiar with organizational science theory and research but unfamiliar with the present research. The panel members were asked to rank each pair of manuscripts in terms of their "general significance and overall contribution to the field." We removed such obvious indicators of quality as the name of the publishing journal from the articles. Panel members worked independently and were not allowed to discuss their rankings. There was perfect agreement between the five panel members and the respondents: for each pair of studies, each of the five students independently rated as significant the same study chosen by the respondent who had done the research.

TABLE 2
Characteristics of Significant and Not-So-Significant Research

Characteristics of Research	Significant		Not-So-Significant		
	Means	Standard Deviations	Means	Standard Deviations	t
Published in a top journal	4.53	1.2	3.10	1.9	4.71***
Elicited a positive response	4.73	0.6	2.66	1.0	12.74***
Has been cited by others	4.71	0.8	2.28	1.1	13.21***
Has been nominated for or received award(s)	2.46	1.7	1.17	0.6	5.24***
Generated favorable feedback	4.46	0.8	2.41	1.0	11.81***
Has been recognized for making a contribution	4.34	0.8	1.83	0.8	16.56***
Was perceived as novel, original, or creative	4.47	0.7	2.21	1.1	12.60***
Has been the basis for research by others	4.41	1.1	2.04	1.0	11.81***
Has led to consulting opportunities	2.57	1.6	1.57	1.1	3.91***
Has appeared in textbooks	4.00	1.4	1.92	1.3	8.16***

*** $p < .001$

The second step in cross-validating the respondents' assessments of significance employed the *Social Science Citation Index*. Again, we selected ten pairs of articles at random. We counted the total number of citations of each article in the five years following its publication, choosing five years because that was the interval between the most recent publications and the time the counts were done. Self-citations were eliminated. For the significant articles, the average total number of citations in five years was 23.6. For the not-so-significant articles, the average was 7.2.

A final qualitative assessment of potential retrospective bias was also performed. The questionnaire included several open-ended questions that asked about issues like how a project originated, what motivated a researcher to become involved with a project, and why the project turned out as it did. A major problem with retrospective bias is that differences in content may appear, depending on whether respondents perceive a topic as positive or negative. For example, they may attribute success to personal hard work and creativity, and failure to bad breaks, chance, an institution, or other factors beyond their control.

The open-ended responses were content-analyzed for systematic differences between significant and not-so-significant projects. Respondents attributed outcomes of significant research projects to factors under their control 63 percent of the time and to uncontrollable factors 30 percent of the time; 7 percent were not classifiable. For not-so-significant outcomes, the proportions were almost exactly the same—65 percent, 29 percent, and 6 percent.

Researchers were willing to attribute both significant and not-so-significant outcomes to their own insights and shortcomings. Reasons given for not-so-significant research outcomes included, "I didn't do a good job of designing the study," "Not enough attention to instrumentation," "I needed a quick publication," and "Methodological problems limit confidence in the results." Some degree of retrospective bias was likely to occur because of the way we gathered the data. However, the count of citations cross-validated the relative significance of the research projects, and some attribution differences that might be expected were not found.

Analyses

The analyses undertaken to explore the three models were simple and straightforward. We first grouped items according to the model they were designed to test. Next, differences between the significant and not-so-significant research were assessed via *t*-tests and chi-square analyses. We used discriminant analysis to test which model's items best discriminated between significant and not-so-significant outcomes.

RESULTS

The Davis Model

Table 3 summarizes the results for the set of 17 items developed to evaluate the Davis model. There is at least one item for each of the 12

TABLE 3
Results of Analysis of the Davis Model

Characteristics of Research	Significant		Not-So-Significant		
	Means	Standard Deviations	Means	Standard Deviations	*t*
Organization					
Phenomenon considered unstructured has structure	2.84	1.3	2.30	1.2	2.28*
Composition					
Diverse phenomena united by single explanation	3.37	1.5	2.27	1.3	4.15**
Single phenomenon composed of subparts	3.34	1.5	2.90	1.4	1.55
Abstraction					
Property of element is property of whole or vice versa	3.05	1.3	2.04	1.1	4.31**
Generalization					
Applied to organizational settings or individuals in general	4.00	1.2	3.37	1.1	2.79**
Property considered characteristic of one group characterizes another group	2.51	1.4	2.23	1.2	1.10
Stabilization					
Unexpected stability of seemingly unstable phenomena, or vice versa	2.67	1.5	2.44	1.3	0.84
Function					
Phenomenon considered ineffective is effective, or vice versa	2.38	1.3	2.29	1.3	0.37
Evaluation					
Phenomenon considered bad is good, or vice versa ·	2.21	1.4	2.04	1.2	0.71
Co-relation					
Identified relationship where none expected	2.98	1.5	2.68	1.2	1.18
Found no relationship where one expected	2.05	1.3	2.00	0.2	0.22
Coexistence					
Phenomena considered incapable of coexistence may exist together	2.27	1.2	2.02	1.2	1.08
Phenomena thought to coexist incapable of coexistence	1.74	1.1	1.85	1.1	−0.49
Covariation					
Accepted relationship has opposite sign	2.36	1.4	2.08	1.1	1.15
Opposition					
Phenomena considered dissimilar are similar	2.84	1.3	2.23	1.1	2.60*
Phenomena considered similar are dissimilar	2.37	1.2	2.17	1.2	0.83
Causation					
Causal relationship in opposite direction (x ⟶ y, not y ⟶ x)	2.28	1.4	1.70	1.0	2.55*

* $p < .05$
** $p < .01$
*** $p < .001$

characteristics identified by Davis, although some characteristics were measured with more than one item. Results for 6 of the 17 items are significantly different, although there is little discernible pattern across the items. For example, the single items developed to measure organization, abstraction, and causation are significantly different for significant and not-so-significant outcomes. In addition, results for one of two items for composition, one of two items for generalization, and one of two items for opposition are significantly different. Overall, then, little support emerged for the Davis model. The characteristics defined by Davis do not seem to be good predictors of significant outcomes in this set of organizational research projects.

The Antecedents Model

Table 4 shows results of one set of analyses for assessing the antecedents model. Respondents were asked to indicate the presence or absence of various institutional conditions and the effects of that condition on each of the two projects. Chi-square analyses revealed that 2 of the 12 factors were different for the two research projects. Specifically, collegial interaction had a more positive effect on significant research than on not-so-significant research. Similarly, the presence of a Ph.D. program also tended to have a positive effect on significant research.

Table 5 presents results pertinent to other antecedent conditions. Three of 12 items were significantly different for the two categories of research, all in the expected directions. All 3 items relate to research method and integration. Bringing together theoretical ideas from diverse fields was associated with significant research, as was the adoption of a method originally designed for use in another field. Using a research method because it was convenient, however, was a characteristic associated with not-so-significant research.

Ambidextrous Model

Two sets of analyses were used to investigate the ambidextrous model. First, we asked respondents to indicate how they felt at the beginning, midpoint, and end of each research project; the questionnaire provided a choice of descriptive terms. The rationale for collecting such data was that we expected some descriptive terms to differ between the two projects and expected some changes from organic to mechanistic over the lives of projects. Table 6 summarizes the descriptive terms and corresponding patterns of responses.

In the half-columns designated 1–8 in Table 6, there are differences in the frequency with which certain terms describe significant and not-so-significant research. For example, terms like "excitement," "inspired," "sense of discovery," and "committed" were more frequently checked for significant research at the beginning, midpoint, and end of a research project. Respondents checked "routineness" more frequently for not-so-significant research. The pattern of description also shows changes in feelings over time, shown in the lower half of Table 6. "Unclear" described the beginning

TABLE 4
Results of Analysis of the Antecedents Model for Institutional Conditions [a]

Antecedent Institutional Conditions	Significant Research	Not-So-Significant Research	χ^2
Teaching load			
Light	17	16	2.63
Moderate	29	23	
Heavy	2	6	
Effect of load			
Facilitated	24	19	0.58
Hindered	5	5	
No effect	22	24	
Collegial interaction			
Infrequent	7	16	5.81
Occasional	16	16	
Frequent	30	18	
Effect of interaction			
Facilitated	39	23	8.59*
Hindered	4	11	
No effect	11	17	
College research orientation			
Research	37	37	2.16
Teaching	0	1	
Mixed	17	13	
Effect of orientation			
Facilitated	42	36	2.03
Hindered	1	1	
No effect	10	14	
Internal financial support			
Weak	21	22	2.73
Moderate	20	23	
Strong	13	6	.
Effect of support			
Facilitated	23	20	0.28
Hindered	4	3	
No effect	26	27	
Reward and promotion system			
Research	44	41	0.02
Teaching	1	1	
Mixed	8	7	
Effect of system			
Facilitated	38	29	4.19
Hindered	0	3	
No effect	16	18	
Ph.D. program			
Yes	52	49	0.39
No	1	2	
Effect of Ph.D. Program			
Facilitated	38	25	29.53***
Hindered	0	24	
No effect	15	7	

   [a] Frequencies of conditions are reported.
     * $p < .05$
  *** $p < .001$

TABLE 5
Results of Analysis of Other Antecedent Conditions

Conditions	Significant Research		Not-So-Significant Research		
	Means	Standard Deviations	Means	Standard Deviations	t
To what extent—					
was involvement attributable to your activity and exposure?	3.51	1.3	3.28	1.5	0.83
was the decision to undertake the project influenced by extrinsic factors?	2.49	1.4	2.65	1.5	-0.59
did the project lack a theoretical base?	2.09	1.3	2.21	1.2	-0.48
A primary reason for doing this project was—					
to apply a new research method or technique.	3.15	1.6	2.73	1.6	1.33
to use an improved, more rigorous method than previously used.	3.25	1.7	2.96	1.5	0.95
to use a method originally used in another field.	2.84	1.4	2.15	1.4	2.53*
to bring together ideas from two or more fields or subfields.	3.98	1.4	3.07	1.4	3.33***
to investigate a topic because it was controversial.	3.25	1.4	2.87	1.5	1.41
personal interest and curiosity.	3.80	1.2	3.40	1.2	-1.76
opportunity to use a convenient method.	2.02	1.3	2.98	1.4	-3.06***
potentially important application.	3.61	1.4	3.30	1.4	1.13
perceived opportunity for publication.	3.59	1.2	3.73	1.1	-0.67

* $p < .05$
*** $p < .001$

TABLE 6
Results of Analysis of Ambidextrous Model for Respondents' Feelings Toward Research [a]

Descriptions	Beginning of Research		Midpoint of Research		End of Research	
	Significant	Not-So-Significant	Significant	Not-So-Significant	Significant	Not-So-Significant
	(1)	(2)	(3)	(4)	(5)	(6)
Differences						
Excitement	48	28	40	2	50	11
Inspired	28	17	24	7	24	6
Serendipity	13	8	11	6	13	5
Fluid	15	7	15	6	6	2
Sense of Discovery	46	22	40	13	38	15
Organic	13	4	13	2	6	1
Committed	44	23	44	26	47	22
Routineness	0	10	3	15	0	16
	(7)	(8)	(9)	(10)	(11)	(12)
Change over time						
Unclear	18	14	14	16	2	11
Uncertain	16	12	10	15	1	11
Orderly	15	21	12	18	19	17
Indifferent	1	4	1	9	1	12
Methodical	16	23	19	23	24	18
Unenthusiastic	1	4	2	10	1	11
Certain	11	12	13	14	26	18

[a] Frequencies of descriptions are reported.

χ^2 for (1) (2) = 19.531, $p < .05$.
χ^2 for (3) (4) = 43.437, $p < .05$.
χ^2 for (5) (6) = 44.263, $p < .05$.
χ^2 for (7) (8) = 6.142, not significant.
χ^2 for (9) (10) = 8.896, not significant.
χ^2 for (11) (12) = 31.902, $p < .05$.
χ^2 for (1) (3) (5) = 15.225, not significant.
χ^2 for (2) (4) (6) = 29.054, $p < .05$.
χ^2 for (7) (9) (11) = 35.811, $p < .05$.
χ^2 for (8) (10) (12) = 10.673, not significant.

of significant research more often than the beginning of not-so-significant research (18 vs. 14) but appeared less often at the end of significant research (2 vs. 11). The same is true for the term "uncertain." "Indifferent" was checked only 4 times to describe feelings at the beginning stages of not-so-significant research, but 12 times for the end of such research. The term "certain" was checked 11 times for the beginnings of significant research and 26 times at the end points of such research. These changes suggest that, over time, significant research becomes clearer, more certain, and more methodical.

Table 7 presents the other set of results pertinent to the ambidextrous model. Nine of the 10 items developed to tap ambidextrous processes are quite strongly associated with differences in research significance, and all results are in the expected direction. The significant projects are character- ized by a large amount of effort devoted to thinking and figuring things out as a project developed. Those activities are consistent with organic conditions at the beginning of a project. Respondents were more emotionally committed to significant projects than to not-so-significant projects and spent more time thinking about methodology, which was more systematic and rigorous in the significant projects. For projects that were not-so-significant, investigators knew exactly what to do from the beginning and had highly quantifiable variables. The general findings shown in Table 7 support the idea that signi- ficant research requires strong commitment, which investigators use to re- duce equivocal research problems to clearly defined outcomes.

The final step in the analysis was to run a multiple discriminant analysis to compare the three models. It was not possible to analyze all items simultan- eously because there were more items than cases. Thus, we summed re- sponses on the closed-ended questions for each model into a single score. The questions that appear in Table 3 composed the Davis model scale; those in Table 5, the antecedents model scale; and those in Table 7, the ambidex- trous model scale. The Davis model scale had the lowest reliability of the three (.58). The reliabilities for the other two scales were somewhat stronger (.78 for the antecedents scale and .83 for the ambidextrous scale). The score for each scale was the basis for discriminating between significant and not- so-significant research.

All three scales are included in the discriminant function, shown in Table 8, which was statistically significant (p < .0001). The weighting among the scales indicates that the items for the ambidextrous scale are the strong- est for discriminating among research projects. We classified 77 percent of the cases correctly using this function. The ambidextrous model alone can classify 73 percent of the cases correctly, indicating the strength of the ambi- dextrous scale for discriminating significant from not-so-significant research.

DISCUSSION

This study addressed the relationship between research context and the significance of research outcomes. Retrospective reports of researchers sug- gest that a number of factors differentiate significant from not-so-significant

TABLE 7
Results of Analysis for Other Ambidextrous Characteristics of Research

Conditions	Significant Research		Not-So-Significant Research		t
	Means	Standard Deviations	Means	Standard Deviations	
To what extent—					
did you have firm expectations?	2.90	1.3	3.30	1.2	-1.59
were methodology and argument systematic, rigorous, and right?	4.25	0.8	3.57	1.1	3.57***
was project exploratory and open-ended?	3.07	1.5	2.49	1.5	2.04*
were variables of interest quantifiable in objective terms?	3.02	1.3	3.57	1.3	-2.16*
did you know what you wanted to do from the beginning?	2.95	1.4	3.53	1.3	-2.26*
was the project based on desire for greater theoretical understanding?	4.27	1.1	3.45	1.3	3.55***
did you figure things out as you went through?	4.02	1.1	2.96	1.2	4.69***
did you expend much effort thinking through theory?	4.32	0.9	2.72	1.2	8.00***
were you emotionally committed and involved?	4.43	0.9	3.38	1.3	4.89***
did you expend much effort thinking through methodology?	4.14	1.1	3.07	1.4	4.45***

* $p < .05$

*** $p < .001$

TABLE 8
Standardized Canonical Discriminant Function
for the Three Scales

Scales	Coefficients
Ambidextrous	.81
Davis	.40
Antecedent	.19
Percentage of cases correctly classified	77
Canonical correlation	.61
Wilks's lambda	.68
Chi-square = 43.9, 3 *df*, p < .0001.	

organizational research. Some of those factors are relevant before research begins, others characterize the process of doing research, and yet others pertain to research outcomes.

Antecedent conditions that seemed important were researchers' interactions with others, the presence of a doctoral program, the integration of ideas and methods from different fields, and taking advantage of chance opportunity. Research outcomes that differentiated significant from not-so-significant research were integrating diverse phenomena by a single explanation, generalizing a finding to a larger system in a novel way, or discovering a causal relationship that runs in the opposite direction.

The ambidextrous model, which describes the transformation that occurs as research progresses, appears to provide the best approach for differentiating significant from not-so-significant research. Significant research was characterized by less clarity and more uncertainty during the beginning stages than was not-so-significant research. Significant research was also characterized by high levels of excitement and commitment through the life of a project. An important aspect of significant research seemed to be the reduction of equivocality during the research process. Investigators expended effort thinking through the theory, and they had to figure things out as they went along. Factors such as knowing exactly what to do from the beginning, quantifying variables in an objective fashion, and being methodical and orderly were characteristic of the beginning stages of not-so-significant research. Significant research projects, however, tended to be more certain, clearer, and orderly in the final publication stage than not-so-significant research projects.

Future research may be able to explore more closely the transformation process associated with significant research outcomes. New studies can focus on how investigators manage organic and mechanistic conditions during the life cycle of a project. Moreover, this study controlled for researchers' ability by comparing research projects for the same researchers. Future studies can explore more fully the effects of investigators' training and ability on research outcomes.

An important idea that emerged from this study is that a particular kind of duality characterizes significant research. Both organic and mechanistic processes and both linear and nonlinear thinking seem to occur. Such research begins in organic settings; the investigators have widespread personal contacts, involvement in many streams of research, and a lack of clarity or certainty. Intrinsic interest and intuition are often the bases for the choice of the research project. The research outcomes, on the other hand, are more mechanistic, in that they are clear and well defined. The investigators have reduced equivocality to produce a rational product that they can publish for the use of colleagues or practitioners.

Nonsignificant research may be dull and routine because it fails to capture that duality. Such research may start with mechanistic, linear thinking. Investigators may choose topics that are already well defined and simply make minor adjustments to them. Reduction of equivocality does not take place, and the research outcome has little impact.

The implication of the findings reported here is that researchers who aspire to do significant research should avoid mechanistic conditions and linear thinking early in the research process. They should instead immerse themselves in the physical and social world of organizations and look for wide exposure and diverse experiences. Investigators who stay isolated from those experiences will tend to undertake research based on the next logical step that follows from a recent journal article and are less likely to achieve something outstanding.

How do researchers know when research is likely to be significant? One answer is that the project feels right, and there is a sense of excitement and commitment. They have not chosen the project strictly on the basis of logic or certainty of publication.

Another indicator is that they feel the need for intellectual effort. The research idea may be in a fuzzy state, so theoretical development and clarification will take effort. Significant research is not convenient. Significant research is not designed to achieve a quick-and-dirty publication. It requires resolve and intense effort. When a study turns out to be not-so-significant, it may be because a researcher did not expend the effort required to develop theory or to clarify poorly defined concepts.

On the basis of the exploratory data reported here, we suggest that research is significant because it reaches into the uncertain world of organizations and returns with something clear, tangible, and well understood. Significant research takes an issue that is not clear, is in dispute, or is out of focus, and brings it into resolution. Rigor and clear thinking are needed to make this transformation. Significant research begins with disorder but ends with order. Significant research embraces the duality by transforming initial organic conditions into mechanistic outcomes. Logic and certainty do not begin the process but are its outcomes. If a researcher knows in advance what the answer will be, and understands the phenomena well enough to predict and control everything that happens, then the problem is probably not significant. Good research requires researchers to be ambidextrous, to

welcome uncertainty in the early stages, and to strive toward certainty as a final outcome.

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RESEARCH NOTES

HIGH-TECHNOLOGY BATCH
PRODUCTION SYSTEMS:
WOODWARD'S MISSING TYPE

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High-technology systems for batch production contrast sharply with traditional batch operations based on craftmanship and simple methods. In small, organic organizations, for example, entrepreneurs and professionals frequently develop and produce high-technology products. Although some products based on new technologies are subsequently mass-produced on a large scale—personal computers are an example—many continue to be manufactured in relatively small batches (Office of Technology Assessment, 1984). One reason is the increasing market demand for customized, high-performance products. Another reason is the revolution in microelectronics, which enables reprogrammable machines to make changes in products without scrapping old equipment, as traditional, highly dedicated mass-production operations had to. Thus, scholars and practitioners need to rethink the concept of batch production by distinguishing between traditional craft and technically sophisticated operations.

The first typology for classifying technology distinguished between batch, mass, and continuous-process production systems (Woodward, 1965). This typology of production systems, which was based on a comparison of 100 industrial firms in England, gave managers and theorists alike a parsimonious means of comparing manufacturing operations and describing how technology affects organizational design. The organizational design literature (Mintzberg, 1979), strategic management data bases like PIMS, and operations management textbooks (Schemmer, 1981) all frequently refer to Woodward's typology. Moveover, a meta-analysis of the literature on technology and organization has suggested returning to her typology to understand the relationship between technology and organization (Fry, 1982).

The revolutionary changes in batch production technologies in the past decade have created a need to update Woodward's (1965) typology. Woodward defined batch production systems as having small lot sizes, low levels of automation, general purpose machinery, and low control of production.

Moreover, she argued that production technologies generally follow an evolutionary pattern of development in which volume, specialization, standardization of workflow, predictability, and control increase. In her typology, batch, mass, and continuous-process production systems represent a linear pattern of technological development. However, that linear, evolutionary model no longer suffices.

Today, many batch operations are moving to technologies that are complex in terms of knowledge, automation, integration, and regulation, yet retain the capacity to produce small runs of different products (Collins, 1986; Gerwin, 1982; Lawson, Reichy, Renner, Rosen, & Smolak, 1983; Shaiken, 1986; Solberg, Anderson, Barash, & Paul, 1985). For example, firms producing turbine engines now use computer-aided design and manufacturing to design engines to customers' specifications and quickly reset machinery to manufacture the requisite parts; both quality and efficiency have summarily improved. Such knowledge-intensive batch technologies with computer controls are simultaneously cost-effective and adaptive owing to the economies of scope that ensue because one machine can produce several kinds of outputs more cheaply and effectively than several specialized machines could (Goldhar & Jelineck, 1983). This dramatic shift in the form and content of technological development was incipient during the period covered by Woodward's study (Burns & Stalker, 1961) but only blossomed in the eighties, with the proliferation of microprocessors.

RECONCEPTUALIZING WOODWARD'S TYPOLOGY

Subdividing batch technology into traditional and technical categories both updates Woodward's typology and links it more closely with other basic variables associated with such characteristics of organizational design as scale (Blau, Falbe, McKinley, & Tracy, 1976) and complexity of knowledge (Collins & Hull, 1986; Perrow, 1967) as well as with current typologies of organizational design (Hage, 1980; Hull & Hage, 1982; Mintzberg, 1979). Scale, a concept implicit in the original typology, encompasses the throughput capacity of operations as manifested in human and mechanical energy. Knowledge complexity encompasses the technical expertise that is manifested in human knowledge and computers.

Our revision of Woodward's (1965) typology differentiates between traditional and technical batch systems on the small side and mass production and process operations on the large side. Batch operations process few items per run, and they have not usually been automated because of their low production volume (Utterback & Abernathy, 1975). Some batch operations, however—such as those in aircraft production—require many highly trained workers. Both mass and process production systems have larger scales of operations than batch production systems (Blau et al., 1976; Schemmer, 1981) but differ from each other in their modes of physical power. Historically, mass production systems have combined mechanical and human power, as in an assembly line with automatic, repeat-cycle machinery. Humans have,

FIGURE 1
Revision of Woodward's Typology of Production Systems
with Structure and Innovative Activity

	Technical Batch	Continuous Process[a]
High	Example: aerospace electronics Capital equipment: computer controlled, general purpose Human resources: professional and technical experts, skilled and semiskilled operatives Structure: organic-professional,[b] adhocracy[c] Innovative activity: high R & D and innovation	Example: petrochemical plant Capital equipment: automated, sometimes computer controlled; integrated Human resources: skilled operatives, large percentage of engineers Structure: mixed,[b] professional bureaucracy[c] Innovative activity: medium-high R & D and innovation

Knowledge Complexity

	Traditional Batch[a]	Mass Production[a]
Low	Example: dress-making, printing Capital equipment: nonauto- mated, general purpose Human resources: skilled or unskilled operatives Structure: traditional-craft,[b] simple structure[c] Innovative activity: low R & D and innovation	Example: carburetor assembly Capital equipment: automated, repeat-cycle, sequential Human resources: semi-skilled operatives, small proportion research and engineering Structure: mechanistic-bureaucratic,[b] machine bureaucracy[c] Innovative activity: low-medium R & D and innovation

Small   Large

Scale of Operations

[a] Industry types were derived from Blauner (1964).

[b] Mechanistic and organic designs were derived from Burns and Stalker (1961), Hage (1980), and Hull and Hage (1982).

[c] Configurational types, derived from Mintzberg (1979), are meant to be suggestive; we excluded his "divisionalized form," which is more appropriate for describing multiorganizations than manufacturing establishments.

however, been conspicuously absent from the work flows of continuous-process production systems, which has obviated the need for some aspects of bureaucratic organization. Figure 1 illustrates these differences in capital equipment.

Woodward also ranked systems in terms of technical complexity, or levels of technical expertise. However, technical batch systems are more similar to process production systems than to traditional batch systems in terms of knowledge complexity. Traditional batch systems require fairly unskilled workers, as do large mass-production operations; this fact may partly explain why Woodward observed structural similarity among the technological extremes for some variables but not for others. For example, techni-

cal batch production is complex, as is continuous-process production, but the two vary in scale. Thus, traditional batch and mass production systems contrast with technical batch and continuous-process operations in terms of the degree of technical expertise involved in production. Figure 1 illustrates these differences in human capital.

The technical batch category we propose corresponds closely to Burns and Stalker's (1961) organic type. To use the innovative potential of employees who are technically expert, organic organizations have high interpersonal feedback, low reliance on hierarchy, high occupational differentiation and decentralization, and low bureaucratic formalization (Aiken & Hage, 1971; Hull, 1988). Moreover, organic design facilitates adaptation to dynamic high-technology markets, as does the "adhocracy" configuration discussed by Mintzberg (1979: 432), because employees have high levels of technical expertise. Thus, scholars have linked the organic type with technological innovation (Aiken & Hage, 1971; Burns & Stalker, 1961; Hull & Hage, 1982).

Mass production systems correspond with Burns and Stalker's mechanistic type partly because of their large-scale and relatively noncomplex throughput technologies, such as assembly lines. Although technologies like robotics could transform mass production, there is little current use of programmable automation in mass production facilities nationally (Office of Technology Assessment, 1984). In contrast, continuous process firms employ large-scale mechanical production based on automation, which reduces reliance on direct human labor. The complex nature of the throughput process, however, increases demands for knowledge. Continuous-process technologies thus have some organic elements of design, which was one of Woodward's (1965) paradoxical findings. Blauner (1964) also noted that continuous process plants free operatives from machine interfaces and increase skill requirements for most other employees.

Differentiating batch systems allows a close conceptual and empirical fit between technology and organizational design. We thus propose the technical batch system as "Woodward's missing type," and suggest that organizations with this kind of production system are likely to have some characteristics of organic design as well as a high degree of innovative activity.

METHODS

Sample

The sample consisted of 110 randomly selected New Jersey manufacturing establishments that were listed by Dunn and Bradstreet as having 200 or more employees (Blau et al., 1976). Blau and colleagues (1976) intentionally included divergent technologies and organizational forms. This sample is remarkably similar to Woodward's (1965) South Essex sample in terms of number of cases and composition of firms.

Measurements

Woodward's scale. Following Woodward's (1965) lead, we coded organizations according to the dominant technology they employed and conducted the analysis using the condensed trichotomy of batch, mass, and process types rather than the complete nine-category scale. Although this coding procedure is crude in that it doesn't accommodate combined systems, only three firms reported more than one production system ($\bar{x} = 1.03$). Including the three cases did not alter the findings reported here.

Structure. Five structural variables were included in the analyses to test for consistent structural differences between simple and complex batch systems; we also included mass and continuous-process systems for comparative purposes. The variables were: (1) supervisory span of control, (2) the number of hierarchical levels in a plant, (3) occupational specialization, (4) decentralization of decision making, subdivided into strategic and line-operating decision making, and (5) formalization. Table 1 shows the intercorrelations of these and other variables, and the Appendix describes the measures.

Scale and complexity. We measured both scale and complexity in terms of two distinct modalities—humans and machines—because the two are interdependent yet can be functional equivalents to some extent. Measuring both human and machine attributes gave us a more accurate map of the nature of production operations. For example, it would be wrong to conclude that a continuous-process operation is on a small scale simply because it has few humans. The Appendix also describes our measurements of scale and complexity.

Statistical Analysis

Our analysis sought to demonstrate (1) that there are consistent differences between traditional and technical batch production systems that call for expansion of Woodward's scale to include two significantly different batch systems and (2) that mean differences between these categories are closely associated with variation in the scale and complexity of operations (Blau et al., 1976; Collins & Hull, 1986; Hage, 1980).

Multiple analysis of covariance (MANCOVA) was our primary analytic technique (Norusis, 1985). Using a one-way MANCOVA design, we tested the null hypothesis that all categories of the main factor variable, Woodward's scale, will have the same means for all dependent variables after the specified covariates of scale and complexity have been controlled. We could have tested multiple dependent variables using repeated ANOVA or ANCOVA procedures, but such bivariate tests ignore the intercorrelations among dependent variables and thus would not have provided as strict a test of differences in means across the dependent variables as the MANCOVA.

The MANCOVA yielded four basic statistical tests: a univariate *F*-test for the independent effect of technology on structure with the other structural variables controlled, a multivariate *F*-test of whether the set of dependent

TABLE 1
Descriptive Statistics and Correlations for Study Variables[a]

Variables	Means	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Traditional batch[b]	18.00	39.00															
2. Technical batch[b]	24.00	43.00	−26														
3. Mass production[b]	39.00	49.00	−38	−45													
4. Continuous process[b]	12.00	32.00	−19	−22	−32												
5. Personnel size	529.02	673.54	−20	−03	13	−02											
6. Automaticity	251.73	113.73	−07	−18	−07	43	07										
7. % professional & technical	7.70	7.48	−38	48	−23	17	19	−09									
8. Use of computers	0.65	0.46	−15	06	03	11	27	05	14								
9. Supervisory span of control	12.47	7.81	17	−27	18	−17	24	−10	−31	06							
10. Number of vertical levels	5.15	0.92	−13	15	−01	−04	46	16	27	12	−22						
11. Occupational specialization	126.61	92.02	−17	28	18	−17	24	−10	36	35	12	40					
12. Strategic decisions	5.11	4.06	−07	24	−14	−14	−05	−12	29	−06	−17	24	17				
13. Line operating decisions	11.76	3.12	−06	12	08	−23	27	−01	05	02	07	31	26	27			
14. Formalization	4.54	2.04	−11	07	06	01	33	15	15	19	−17	30	34	−06	18		
15. % R & D employees	2.11	4.01	−10	30	−18	03	07	−07	52	18	−16	16	20	35	10	10	
16. Patents per employee	0.20	0.27	−24	12	01	14	26	−12	41	28	−13	15	24	21	−09	16	22

[a] For coefficients >.16, $p<.05$; decimal points omitted.
[b] These were dummy variables. Means are expressed as percentages.

variables differed significantly across technologies, an a priori test of differences between the traditional and technical batch categories, and an F-test of differences in means across categories with scale and complexity controlled.

To illustrate the utility of our framework, we include a separate analysis of the differences in innovative activity across the new technology categories (see Table 2). We expected to find significant differences in innovative activity between traditional and technical batch categories since they vary in terms of technological complexity and structural attributes.

RESULTS

Traditional and technical batch operations are similar in scale and, of course, dissimilar in knowledge complexity, the criterion variable we used to subdivide Woodward's (1965) batch category. Table 1 shows that both traditional and technical batch operations are negatively associated with personnel size (−.20 and −.03, respectively) and automaticity (−.07 and −.18, respectively). A test of subgroup differences between traditional and technical batch operations (an analysis of variance, not shown) confirmed that there were no significant differences between the two batch systems for either indicator of scale. But because the two batch categories differ in knowledge complexity, their correlations are opposite in direction for many of the variables shown in Table 1, as a comparison of columns 1 and 2 for rows 8–16 indicates.

Subdividing batch operations on the basis of knowledge complexity allowed more powerful and parsimonious prediction of differences in organizational structure. Traditional and technical batch operations differed significantly on supervisory span of control, occupational specialization, and decentralization of strategic decisions, as univariate F-tests of the results in columns 1 and 2 of Table 2 indicate.

The results in Table 2 also show that the technical batch category corresponds in several respects to Burns and Stalker's (1961) organic type. Interpersonal feedback is high, as indicated by a narrow span of supervisory control. Occupational specialization is high, and strategic decisions are decentralized, so that technical experts can have input. However, the correspondence with the organic type is imperfect because some dimensions of organizational structure usually associated with bureaucracy—such as number of vertical levels, decentralization of line operating decisions, and formalization—are average rather than low. One reason is that the number of employees was slightly above average for the technical batch category (data not shown), and this variable was a strong correlate of bureaucratization. Controlling the covariates adjusted these characteristics of organizational design downward and improved the correspondence with the organic type (adjusted means not shown). It is also possible that some of the firms in the technical batch category are more bureaucratic than would be optimal for their niche (Hull & Hage, 1982).

In addition to demonstrating the importance of subdividing the batch production category on the basis of knowledge complexity, Table 2 shows

TABLE 2

Correspondence Between Reconceptualized Technology Categories, Organizational Design Variables, and Innovative Activity

Variables[a]	Production Technology				No Covariates F^a	Scale and Complexity Controlled F^a
	Traditional Batch	Technical Batch	Mass Production	Process Production		
Structure						
Supervisory span of control	15.22[b]	8.69	14.23	8.83	5.29**	1.36
Number of vertical levels	4.90	5.39	5.14	5.24	1.11	0.49
Occupational specialization	94.06[b]	172.89	120.81	109.51	3.23*	2.02
Decentralization						
Strategic decisions	4.52[b]	6.89	4.41	3.57	3.23*	1.87
Line-operating decisions	11.36	12.46	12.09	9.79	2.54†	2.27†
Formalization	4.05	4.81	4.70	4.62	0.60	0.27
Multivariate effects					2.23**c	1.09c
Innovative Activity						
% R & D employees	1.30[b]	4.17	1.24	2.46	3.30*	0.71
Patents per employee	0.06[b]	0.26	0.20	0.30	2.49†	0.59

[a] Results for structure are based on MANOVA and MANCOVA analyses; results for innovative activity, on ANOVA and ANCOVA.

[b] Subgroup contrasts between traditional and technical batch technologies are significantly different at $p < .05$.

[c] Pillai's T statistic.

† $p < .10$
* $p < .05$
** $p < .01$

results of the multivariate analysis of covariance test of mean differences in structure for each of Woodward's four categories, with scale and complexity controlled. While the multivariate effect of technology on structure, indicated by Pillai's T (column 5), was significant, controlling the four covariates resulted in an insignificant T (column 6). Examining the univariate Fs indicated that the covariates explain three of the five relationships between structure and technology. The sixth variable, formalization, was not related to Woodward's scale, although it was highly related to personnel size.

Decentralization of strategic decisions remained significant even after we controlled for scale and complexity. An analysis of subgroup contrasts indicated that this is due to relatively high levels of centralization in the continuous-process production category. One explanation is that continuous-process operations are highly capital intensive, highly dedicated systems, and therefore decisions are made at the strategic apex to achieve integration across their interdependent subsystems. However, our measure of machine scale, automaticity, which is highly correlated (.43) with continuous process operations, is unrelated to either type of decision making. Another explanation may be that continuous-process operations manufacture mature products in markets with few competitors (Utterback & Abernathy, 1975). Since there is little room for change in products or processes, decentralizing decision making is not relevant.

By subdividing the batch category we achieved a closer conceptual fit between Burns and Stalker's (1961) structural typology and Woodward's (1965) technical system typology. A discriminant analysis (not shown) of structural differences between traditional and technical batch systems indicated that approximately 91 percent of the cases can be correctly classified, indicating a good overall fit (canonical correlation = .709; eigenvalue = 1.01).

The importance of understanding high-technology batch systems was underscored when we examined measures of innovative activity across our revised versions of Woodward's technology categories. Included in Table 2 are two measures of innovation: (1) the percentage of employees engaged in research and development and (2) patent output. The F statistics in the bottom two rows of Table 2 indicate significant differences among the four categories for both variables. Further comparison of the means of traditional and technical batch operations indicates that, as predicted, firms in the technical batch category have significantly more R & D employees (4.17 vs. 1.30%) and patent applications per employee (.26 vs. .06) than their traditional batch counterparts. These findings reaffirm our position that there are differences among batch firms in their capacity for innovation.

CONCLUSIONS

Woodward's technology measure predicts variation in organizational design and performance better if it is enlarged to include a distinction between technical and traditional batch technologies. The technical batch category corresponds more closely in several respects with the organic type of

organization than with the traditional batch category. Rapid technological change requires us both to acknowledge the diversity in batch technologies and to incorporate the differences into theories of technology and organization.

Knowledge-based technologies, like human expertise and programmable automation, allow batch operations to capitalize on the expected long-term demand for low-cost, customized products. However, the competitive benefits of technical batch production are interconnected with organizational design and management (Hage, 1986; Office of Technology Assessment, 1984). For example, technical experts need to participate in strategic decision making in order for their knowledge to benefit their organizations. Distinguishing between technical and traditional batch-production systems gives managers a better conceptual basis for managing small-scale knowledge-intensive production systems.

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APPENDIX

Traditional and technical batch systems. We subdivided batch systems at the median percentage of professional and technical workers in the sample. Rationale: (1) professional and technical employees have a more codified knowledge base than their nonprofessional counterparts, which (2) influences how an organization manufactures its products. Of 46 batch systems, 20 were traditional and 26 technical.

Supervisory span of control. The number of nonsupervisory employees divided by the number of managers and supervisors (Blau & Schoenherr, 1971).

Vertical levels. The number of vertical levels in the longest chain of command at the plant. Identified by plant manager; always referred to line functions (Blau et al., 1976).

Occupational specialization. The total number of unique white- and blue-collar job titles at a site. Differs from task specialization in that the job of a line worker may include many different specific tasks (Blau & Schoenherr, 1971).

Decentralization. The positional level at which decisions are made (Blau et al., 1976). We divided 24 centralization items into (1) strategic decisions and (2) line-operating decisions by assessing the face validity of each question, followed by a principal components analysis of each category (oblique rotation). We used only items loading on the first component for each category. Items for strategic decisions were price outputs, produce new product, choose material suppliers, determine volume of output (eigenvalue = 2.73). Items for line-operating decisions were allocate production work, hire production worker, promote production worker (eigenvalue = 1.40). The low positive intercorrelation (.27) indicates that these decisions are sufficiently dissimilar.

Formalization. The degree to which rules and regulations are formally specified; a composite score based on nine dichotomous questions. Items: number of pages in S.O.P., have organization chart, production workers given operating instructions, workers' written job descriptions, line supervisors' written job descriptions, blue-collar performance records, nonsupervisory white-collar performance records, line supervisory performance records, administrative statistical performance records (Hickson, 1966; Pugh et al., 1969).

Personnel size. The natural logarithm of the total number of employees at a site (Blau & Schoenherr, 1971; Cullen & Baker, 1984; Hickson et al., 1969; Kimberly, 1976).

Automaticity. Geometric weighting of the percentage of machines in each category of Amber and Amber's (1962) scale of automaticity (Collins & Hull, 1986). There is a high correlation (.80) between capital assets and automaticity (40 cases).

Percentage of professional and technical workers. Occupations included are high on use of data, training time, verbal and quantitative aptitude, and abstraction, and low on work repetitiveness. Managers and officials were excluded (Ross & Treiman, 1980).

Use of computers. The total number of production and engineering functions in which computers were used at a plant (Blau et al., 1976).

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RESOURCE SCARCITY, ENVIRONMENTAL UNCERTAINTY, AND ADAPTIVE ORGANIZATIONAL BEHAVIOR

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Studies of environmental influences on adaptive organizational behavior have generally focused on two major aspects of the environment. One is environmental uncertainty as perceived by managers (Lawrence & Lorsch, 1967; Yasai-Ardekani, 1986), and the other is scarcity of critical resources (Pfeffer & Salancik, 1978), especially during periods of slow economic growth (Ansoff, 1979). Although most researchers today would accept some combination of the two separate but related perspectives (Hrebiniak & Joyce, 1985; Lawrence & Dyer, 1983; Yasai-Ardekani, 1986), most research has investigated the effects of only one of the two. This study investigated the effects of both uncertainty and resource scarcity, in interaction with organizational structure, on five broad categories of organizational adjustments: procedural, personnel, process, structural, and strategic.

Adaptation is a general term for the process of accommodation between an organization and its environment (Lawrence & Dyer, 1983). Described as a period of gradual, long-continued, and incremental change in response to environmental conditions (Tushman & Romanelli, 1985), it differs from discontinuous, revolutionary change leading to a major transformation and reorientation of an organization (Miller & Friesen, 1980). Adaptational changes can differ greatly in breadth and cost and can affect an organization's control systems, structure, allocation of resources, strategy, and core values and beliefs (Tushman & Romanelli, 1985). Although simultaneous changes during periods of adaptation are possible, the principle of minimum intervention found in the literature on strategy suggests that policy makers who are intendedly rational will attempt to choose courses of action that solve their problems with minimal financial and human cost to their organizations (Hrebiniak & Joyce, 1984). The following hypothesis is consistent with the notion of a progressive hierarchy of adaptive organizational acts and a doctrine of minimum intervention:

> Hypothesis 1: Among five broad types of organizational
> adjustments, arranged in ascending order of scope and
> cost—procedural, personnel, process, structural, and stra-
> tegic—the less costly will occur with significantly greater
> frequency than will the more costly.

The use of uncertainty as an environmental variable flows from an information-processing view of organizations that treats environments as a source of information (Galbraith, 1973; Lawrence & Lorsch, 1967). Scholars

taking such a view explain organizational adjustments by variations in information, as filtered by managerial perceptions of their external environment (Lawrence & Lorsch, 1967). The use of resource availability or scarcity as an environmental variable flows from a resource dependence view of organizations that treats environments as arenas in which all compete for resources (Aldrich, 1979; Aldrich & Pfeffer, 1976; Pfeffer & Salancik, 1978). Adjustments are explained by disruptive resource instabilities and the inabilities of organizations to acquire and control critical and scarce resources (Aldrich, 1979). The effects of environmental uncertainty and resource scarcity on an organization are a stream of adaptive organizational acts (Lawrence & Dyer, 1983).

> Hypothesis 2: The greater the environmental uncertainty perceived by organizational decision makers and the greater the scarcity of environmental resources, the greater the frequency of procedural, personnel, process, structural, and strategic organizational adjustments.

Commenting on the adaptational histories of seven different industries, Lawrence and Dyer (1983) suggested that environmental conditions interact with the form or structure of an organization to facilitate or impede adaptive organizational behavior. They considered an organic structure to be generally the best suited to coping with or adapting to a turbulent environment. Miller and Friesen suggested that during periods of adaptation, environmental and organizational characteristics interact to "manifest gestalts, that is common configurations of mutually reinforcing elements" (Miller & Friesen, 1980: 593). One gestalt identified combines an organic structure and a turbulent, dynamic environment (Lawrence & Lorsch, 1967; Miles & Snow, 1978; Mintzberg, 1979). An organic structure, with its low degree of formality and high degree of information sharing and decentralization, enhances an organization's flexibility and ability to adapt to continual environmental change and uncertainty (Mintzberg, 1979). "When change is accelerated, more and more novel first-time problems arise, and traditional forms of organization prove inadequate" (Toffler, 1970: 135).

> Hypothesis 3: Organic structures, characterized by participatory decision making, a decentralized hierarchy of authority, and few formalized procedures, will be associated with conditions of high environmental uncertainty and high resource scarcity. The interaction between environment, uncertainty and scarcity, and organic structure will explain more of the variation in frequency of organizational adjustments than will both environmental variables alone or organic structure alone.

METHODS

Organizations and Respondents

This study included 88 primary and secondary schools scattered over 14 counties in a northwestern state. In the last two decades, there have been

extensive changes in the environments of schools: generally diminished levels of economic activity, declining enrollments, decreasing federal and state aid funds, and increasing operating costs caused by growth in teachers' salaries and instructional and transportation costs.

A population of schools within 21 school districts was divided into three strata of schools: elementary, junior high or middle, and senior high. The school districts were all unified districts with operating high schools and student enrollments of at least 5,000. Employing a table of random digits, I selected 55 schools from each strata for a total sample of 165 schools. Following the argument that top administrators can provide reliable information about basic environmental and organizational characteristics of their organizations (Hrebiniak & Snow, 1980; Tung, 1979), I distributed questionnaires to the principal or senior administrative officer of each school.

Respondents returned 88 usable questionnaires, representing 27 elementary, 22 junior high or middle, and 39 senior high schools; the response rate was 53 percent. The schools had an average enrollment of 966 and a range of 107 to 2,093 students. They spanned a variety of environmental settings, from urban locations with high proportions of minority residents (31.4 %) and members of low socioeconomic groups to suburban and rural locations with high proportions of white residents and members of high socioeconomic groups. Nonresponding schools did not differ from responding schools in student enrollment ($t = .21$, $df = 163$, n.s.) or type of district. Districts fell into three groups in terms of enrollment: small, 5,000 to 6,999; medium, 7,000 to 12,999; and large, over 13,000 ($\chi^2 = 1.37$, $df = 2$, n.s.).

Measures

The study employed scales standardized and validated by other researchers. Preliminary interviews and test questionnaires administered to 15 top school administrators generated information on the sectors of schools' task environments and the types of organizational adjustments school organizations had made.

Environmental uncertainty refers to the extent to which organizational decision makers perceive unpredictable changes in their external environment. I used a 9-item, 5-point Likert measure adapted from the work of Duncan (1972) ($\alpha = .78$). The questions, which appear in the Appendix, require respondents to rate their ability to predict actions and changes in their schools' task environment sectors, including supplies of teachers and educational materials; relationships with teachers' unions, school boards, and state legislators; and regulatory control by state, federal, and local agencies. A factor analysis of the nine items with varimax rotation demonstrated that they all loaded substantially on one common factor with an eigenvalue of 2.65; individual loadings were .56, .78, .57, .44, .48, .41, .45, .69, and .38.

The measure of environmental resource scarcity, also shown in the Appendix, was the percentage change in total enrollment reported for a three-year period. The 88 schools reported an average decrease in enrollment of 8.8 percent. I used enrollment change as a measure of resource availability or scarcity because, in the state in question, revenue allocations

to primary and secondary schools depended, through a variation of formula funding, upon past enrollment levels. Determining a period for analysis is always more or less arbitrary (Miller & Friesen, 1980). This study used a three-year period because conditions in the recent past affect current organizational performance (Schendel, Patton, & Riggs, 1976), and organizational decision-makers consider the recent past, as opposed to earlier periods, when formulating strategic and other adjustments (Zammuto, 1983).

Frequency of organizational adjustments was measured through a scale, also shown in the Appendix, developed by Ungson and Schwab (1980). Their instrument, which they adapted from Miles (1975), incorporates five categories of adjustments. These are the five categories, arranged in ascending order of scope and cost, with an example of each type: procedural, changes in rules and work procedures; personnel-related, hiring and firing of employees; process, changes in budget allocations; structural, creation or elimination of departments; and strategic, changes in basic instruction or services offered. Respondents indicated how often within the last three years their school had made a particular adjustment as a direct response to actions by environmental groups such as suppliers, teachers' organizations, and governmental regulatory agencies. The responses for each adjustment variable ranged from "never" to "more than ten times" and were assigned weights from 1 to 5. Factor analysis of the five adjustment variables demonstrated a single common factor with factor loadings of .42, .41, .53, .40, and .48. I computed a single composite overall measure of frequency of organizational adjustments (α = .74) by averaging the unweighted score on each of the five adjustment variables. The individual factor loadings and correlations among the variables were, however, low enough to justify retention of each adjustment variable (see Table 1).

Organizational structure was determined by Hage and Aiken's (1969) three perceived measures of nonformalization: absence of rules and procedures ("There is no operating rules manual"), participatory decision making, and decentralization of the hierarchy of authority ("A person who wants to make his/her own decisions would be quickly discouraged"). Previous research (Dewar, Whetten, & Boje, 1980) has shown the three measures, which consist of five items each, to be reliable. The measures are among the most commonly identified and studied dimensions of organizational structure. The reliability coefficients obtained in this study for the three structure measures were .60, .80, and .91, respectively. Following a procedure outlined by Leifer and Huber (1977), I computed a composite measure of organic structure (α = .84) by averaging the unweighted mean scores on the individual measures.

ANALYSES AND RESULTS

Decentralization and participatory decision making exhibited relatively high mean scores (see Table 1), a finding consistent with Weick's (1976) descriptions of educational organizations as loosely coupled structures. A

second finding, not expected but consistent with previous research by Pen-
nings (1975), was that structure showed little or no correlation with the
environmental variables. Like previous research that has failed to show a
relationship between perceived environmental uncertainty and sales vari-
ability (Yasai-Ardekani, 1986), perceived environmental uncertainty showed
little or no correlation with resource scarcity. This finding seems to suggest
that school administrators may have failed to perceive change or variability
in student enrollment as a source of uncertainty.

As Hypothesis 1 predicted, a correlated *t*-test (p = .05) showed that the
frequency of procedural adjustments was significantly greater than the fre-
quency reported for the other four types of adjustments. Schools employed
personnel and process adjustments significantly more often than structural
and strategic adjustments and employed structural adjustments more often
than strategic adjustments. Perceived environmental uncertainty was associ-
ated with the frequency of all organizational adjustments—with the excep-
tion of strategic adjustments—and environmental resource scarcity was asso-
ciated with the frequency of process, structural, and strategic adjustments.
These findings supported Hypothesis 2.

Moderated regression analysis, as outlined by Zedeck (1971), was used
to test Hypothesis 3, which stated that the frequency of organizational adjust-
ments would be related to the interaction between both environmental vari-
ables and structure. I first regressed the five individual and composite adjust-
ment variables on the three independent variables, uncertainty, scarcity, and
organic structure, and on the interaction of uncertainty and scarcity. The
next step was to regress the adjustment variables on the three independent
variables and the two-way interaction term, uncertainty × scarcity, and on
the three-way interaction term, uncertainty × scarcity × structure. A signifi-
cant interaction between environment and structure was indicated if the
addition of the three-way interaction term resulted in a significant increment
in R^2.

Althauser (1971) demonstrated that problems of multicollinearity may
arise with the use of multiplicative terms in regression analysis. To adjust for
this condition, I corrected the multiple regression equation by subtracting
the means of the variables from the individual values included in the
interaction, or product, term.

Table 2 shows that both environmental uncertainty and resource scar-
city accounted for variations in the overall frequency of organizational
adjustments. Uncertainty was the strongest contributor to procedural
adjustments, and resource scarcity was the strongest contributor to the fre-
quency of process, structural, and strategic adjustments. Contrary to Hypoth-
esis 3, the incremental addition of the three-way interaction term produced
no significant interaction effect.

The statistical power of the tests was checked to determine the possible
effect of sample size on the findings. On the basis of a conventional medium-
sized effect, as indicated by a population r of .30 (Cohen & Cohen, 1983), I
determined the odds that a test would be significant to be .82. This value
exceeds the acceptable significance value of .80 indicated by Cohen and

TABLE 1
Descriptive Statistics
and Intercorrelations Among Variables[a]

Variables	Means	s.d.	Zero-Order Correlation Coefficients								
			1	2	3	4	5	6	7	8	9
1. Environmental resource scarcity[b]	8.78	8.72									
2. Environmental uncertainty	2.52	0.57	16								
3. Participativeness	4.00	0.82	-04	-02							
4. Decentralization	4.15	0.69	03	-06	23**						
5. Lack of formality	2.66	0.42	-02	-08	07	01					
6. Procedural adjustments	3.11	0.94	09	20*	06	05	-17				
7. Personnel adjustments	2.81	1.05	-03	19*	01	02	-08	51**			
8. Process adjustments	2.80	0.95	38**	24**	04	01	01	45**	51**		
9. Structural adjustments	2.14	0.85	27**	19*	08	-12	-15	35**	24**	45**	
10. Strategic adjustments	1.84	0.97	25**	12	05	03	-18	19**	25*	48**	45**

[a] $n = 88$.
[b] Percentage change for total enrollment for 3-year period.
*$p < .05$
**$p < .01$

TABLE 2
Results of Multiple Regression Analyses
of Adjustment Variables on Environment and Structure

Independent Variables	Adjustment Variables[a]					
	Procedural	Personnel	Process	Structural	Strategic	Overall
Environmental uncertainty	.21*	.15	.04	.19	.20	.23*
Resource scarcity	.16	−.11	.37*	.24*	.24*	.39*
Organic structure	.17	.18	.05	−.08	−.02	.18
Uncertainty × scarcity	.12	−.03	.09	.09	.12	.09
R^2	.10*	.07	.14*	.14*	.12*	.25*
Uncertainty × scarcity × structure	−.08	−.04	.03	.13	.12	.01
R^2 with 3-way interaction	.11	.09	.17	.16	.14	.26

[a] Reported statistics are standardized regression coefficients.

*$p < .05$

Cohen, and suggests that the size of the study's sample did not significantly bias the findings.

DISCUSSION

The results of the present study are consistent with the notion of organizational adaptation as incremental or successive change in a wide range of organizational activities (Miller & Friesen, 1980; Tushman & Romanelli, 1985). Although my findings require corroboration because they represent only a single type of organization, they suggest that there is a hierarchy of adaptive organizational responses. School administrators reported using a progressive hierarchy of five broad categories of organizational adjustments. Over a three-year period, the least costly occurred most frequently, and the most costly occurred least frequently. The schools studied adjusted to changing environmental conditions by reducing free time for students, which was a procedural adjustment; by eliminating positions for teacher–coordinators and reading specialists, a personnel adjustment; and by reducing expenditures on textbook repairs and local and out-of-district travel, a process adjustment. They also created school closure task forces—a structural adjustment—and closed under-enrolled schools, which was a strategic adjustment.

The findings of this study also appear consistent with a suggestion made by Hrebiniak and Joyce (1985) that both organizational/managerial and environmental elements determine adaptation. The amount of uncertainty administrators perceived and the relative scarcity of critical resources were both associated with the overall frequency of adjustments made by the schools. Viewed in a context that treats an environment as a source of information and resources (Lawrence & Dyer, 1983), the results reported here may reflect an increase in environmental turbulence (McCann & Selsky, 1984) and a growing dependence of organizations on outside resources (Ansoff, 1979).

Although organization and environment are both important for understanding adaptation, changes in managers' perceptions of uncertainty and changes in available resources may generate different types of organizational adjustments. Whereas perceived environmental uncertainty appeared to account for variations in the frequency of the schools' procedural adjustments, resource scarcity appeared to account for variations in the frequency of process, structural, and strategic adjustments. In an environment where information is lacking, uncertainty may appear as numerous short-range fluctuations in external conditions requiring modest adjustments on the part of an organization. An environment where adequate resources are lacking, however, can pose a far greater and longer lasting threat to an organization. Changes in available resources may require broad changes in the structure and strategy of an organization.

Contrary to some arguments concerning the structural context of adaptation (Lawrence & Dyer, 1983), the interaction of schools' structures and environments appeared to be unrelated to the occurrence of organizational adjustments. The reason for this finding is somewhat unclear; it may in part reflect a restricted range of variables. Whetten (1981) suggested that the structures of educational organizations do not contribute to their adaptive behavior because such structures lack integration and authority. He maintained that "the key to enhancing the adaptive potential of these [educational] organizations is utilizing the pressure of [resource] scarcity to spur innovation" (Whetten, 1981: 92).

The environment of school organizations has undergone important changes in recent years. With declining enrollments and funding and increasing operating expenses, the schools' ability to change in response to changes in their environment may grow in importance (Cameron, 1984). This study suggested that some school organizations have responded to an uncertain and changing resource environment by undertaking a wide range and progressive hierarchy of adaptive organizational acts.

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APPENDIX

The following are reproductions of some scales used in this study.

Environmental uncertainty. The following nine items . . . call for a graded response from 1 = none to 5 = very high (reverse-scored):

Please indicate your ability to anticipate or accurately predict changes and the effects of each item listed below on your school.

Supply or availability of teachers and other specialized personnel.

Supply of educational materials and buildings.

Amount of funding available and budgeted to your school.

Governmental regulatory control by state, federal, and local agencies.

Political attitude of community and other public constituencies toward your school.

Relationship with school board, state legislatures, congress, and the courts.

Relationship with teacher unions or organizations with jurisdiction in your school.

Development of new or improved instructional teaching methods by the scientific-university community.

Development of new or improved curriculum and student services.

Environmental resource scarcity. Over the last 3 years, what has been the average percentage increase or decrease in student enrollment in your school? Indicate percentage figure and whether it is a decrease or increase.

Frequency of organizational adjustments. Responses were expressed in terms of five categories—never; rarely, once or twice; sometimes, three to five times; frequently, six to ten times; and considerably, more than ten times:

Organizational adjustments refer to a broad range of changes in organizational procedures, processes, structure, etc., that are undertaken by organizations to maintain and improve their relationship with the environment. Within the last three-year period, how often did your school make the following organizational adjustments as a direct response to actions by suppliers, teacher organizations, the community, government regulatory agencies, and so forth?

Procedural adjustments are changes in rules, work procedures, methods, and scheduling, etc.

Personnel-related adjustments are hiring and firing of personnel; hiring of specialists or consultants; changes in selection and training policies, etc.

Process adjustments are major changes in budget allocations; significant modifications of planning and control systems, etc.

Structural adjustments are additions to equipment and facilities; creation or elimination of departments, etc.

Strategic adjustments are changes in basic instruction or services offered; abandonment of major classes or services, etc.

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MEASURES OF MANIFEST CONFLICT
IN INTERNATIONAL JOINT VENTURES

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Scholars (Pondy, 1967; Thomas, 1976) have noted that the literature shows little consensus on the nature of conflict. This lack of consensus has led others (Lusch, 1976; Mack & Snyder, 1957) to call conflict an elastic concept, one that can be stretched and molded to suit the purpose at hand. However, there has been little disagreement about Pondy's (1967) work, which seems to have greatly influenced how researchers view conflict.

Conflict can be thought of as "overt behavior arising out of a process in which one unit seeks the advancement of its own interests in its relationship with the others" (Schmidt & Kochan, 1972: 363). Pondy (1967) viewed conflict as a dynamic process consisting of latent, perceived, affective, manifest, and aftermath stages.

The stage of latent conflict encompasses potential sources of conflictual behavior like role deviance, allocation of scarce resources, divergence of goals, bad communication, and drives for autonomy. Perceived conflict is an individual's perception or awareness of being in conflict with another. It is a cognitive state. Stress, tension, hostility, and anxiety characterize affective conflict. These feelings are necessary, but not sufficient, conditions for conflictual behavior to arise. Manifest conflict is the activity dimension of conflict. Conflictual behavior refers to overt activity like written or oral exchanges expressing disgreement between two or more parties. Conflictual behavior can range from passive resistance to overt aggression.

The purpose of this study was to develop and test a new research instrument for measuring manifest conflict within a new context. The context chosen was multinational joint ventures. In developing the proposed instrument, I borrowed from Brown and Day's (1981) measures of manifest conflict in franchised business structures. I adopted their measures and assessed the reliability and validity of the proposed instrument.

To adequately examine measures of manifest conflict, a researcher must select a setting in which activity that can be defined a priori as manifest conflict is pervasive enough to be measured empirically. Multinational joint ventures provide such a setting. In multinational joint ventures, which are

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entities formed by two or more firms of different nationalities for profit-seeking purposes, each partner holds some share of equity, has some control, and shares in the risk of the undertaking (Raveed, 1980). In an earlier study (Habib, 1983), I showed that there is a significant disparity of goals between the partners of joint ventures. Furthermore, the greater the disparity in partners' goals, the higher the level of conflict in a venture. Peterson and Shimada (1978) found that cultural differences are the sources of management problems in American-Japanese joint ventures. Janger (1980) reported the findings of a survey conducted by the Conference Board that showed that the majority of U.S. companies go into multinational joint ventures with developing countries not because they wish to but because they must. Killing (1982) reported that multinational joint ventures have a high failure rate. He cited a study conducted by the Boston Consulting Group that found that in the period between 1972 and mid-1976, more than 90 ventures between U.S. and Japanese firms collapsed.

There have been a number of attempts to test models of interorganizational conflict. Hunger and Stern (1976) used a laboratory parasimulation to measure perceived, affective, and manifest conflict. They employed evaluation of intergroup messages to examine the frequency and intensity of manifest conflict and assessed the reliability of their measures. Most researchers have used field surveys to measure interorganizational manifest conflict. Assael (1968) examined the intensity and frequency of conflict in nine industries as documented in government and trade publications from 1947 to 1965 but did not report validation of measures. Brown and Day (1981) examined six measures of manifest conflict and evaluated their reliability, content validity, nomological validity, and convergent validity. Brown and Frazier (1978) examined the frequency and issue importance dimensions of manifest conflict and reported nomological validity. Eliashberg and Mitchie (1984) examined the intensity and frequency of conflict and reported an analysis of reliability. Etgar (1979) examined affective, manifest, and perceived states of conflict, using frequency of disagreement to measure manifest conflict; he also reported nomological validity. Kelly and Peters (1977) used frequency of disagreement to measure manifest conflict and reported the reliability, convergent validity, and nomological validity of their measures. Lusch (1976) examined manifest conflict using frequency of disagreement and reported reliability, convergent validity, and nomological validity.

METHODS

Sample

Questionnaires were mailed to the presidents of a systematic random sample of 258 multinational joint ventures in the chemical and petrochemical industries. I selected the sample from a roster of joint ventures compiled from three sources: (1) *Mergers and Acquisitions* (1974–78), (2) the *Annual*

Statistical Report (Federal Trade Commission, 1978–81), Bureau of Economics, and (3) a list provided by Jerome L. Duncan, Jr., of the University of Manitoba in Canada.[1] The roster covered companies of different sizes that were operating in the chemical and petrochemical industries between 1968 and 1981. In the vast majority of the companies, English was the language spoken; Arabic, Italian, and Spanish were other predominant languages. All questionnaires were in English. I asked the presidents to whom the questionnaires were sent to ensure that the individual most familiar with joint venture answers the questionnaire and asked all respondents to describe their firm's primary role in the venture and their own degree of familiarity with it. Responses from individuals who indicated unfamiliarity with the joint venture were excluded. I received a total of 38 usable responses from employees of firms engaged in joint ventures who were familiar with the venture and whose primary role was marketing. The response rate was 15 percent; although low, it is within the range of similar recent studies: Brown and Day (1981) reported 21 percent, Roering and Mitchie (1978) reported 16 percent, and Berg and Friedman (1978) reported 5–20 percent.

To test for nonresponse bias, I sent a set of 50 modified and shortened questionnaires to nonrespondents and received 12 responses. Various *t*-tests revealed no significant differences between respondents and these nonrespondents (p<.05.)

Measures

This study employed a psychometric paradigm, as outlined by Churchill (1979), to construct the measures of interest. The instrument construction phases consisted of item generation, questionnaire pretesting, and purification of measures.

Exploratory research typically uses several techniques to generate measurement items: literature searches, experience surveys, critical incidents, and focus groups (Nunnally, 1978). For this study, I undertook a search of the literature and experience surveys (Churchill, 1979) of a judgment sample of experienced executives who could offer ideas and insights into joint ventures. I conducted unstructured interviews in Houston, Texas, and Midland, Michigan, with nine executives from major American multinational corporations heavily engaged in domestic and multinational joint ventures. The purpose of the interviews was to generate a pool of items related to causes of conflict in multinational joint ventures.

The literature search and field interviews generated 50 issues related to manifest conflict in multinational joint ventures. A committee of four researchers undertook a rigorous content analysis of the issues to determine those most frequently mentioned. I combined the 20 issues that emerged into a questionnaire and used it to conduct a pretest in a small pilot study with

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[1] Duncan's data contained Canadian and American joint ventures in the oil, chemical, and petrochemical industries and covered the period between 1968 and 1974.

individuals from ten companies in California, Michigan, and Texas.[2] Only 14 of the 20 proposed items had alphas of 0.6 or better. I employed those items in the final survey; examples include the degree of separation between a joint venture and a parent company, control of key decisions, retained earnings, contract negotiations, and partners' roles. The Appendix lists all 14 items.

In most field studies, researchers have measured interorganizational manifest conflict by using either the frequency of disagreement (Brown & Frazier, 1978; Etgar, 1979; Lusch, 1976) or the intensity of disagreement between parties (Assael, 1968), or both (Brown & Day, 1981; Eliashberg & Mitchie, 1984; Habib, 1983). In this study, I asked respondents to rate both frequency and the intensity of disagreement of each of the 14 issues. The Appendix describes the response formats and anchors.

The measures rely on respondents' recollections of expressed disagreements between partners in joint ventures over a set of issues. Following a procedure similar to Brown and Day's (1981), I developed four measures of manifest conflict. The first is the sum of responses on the frequency of disagreements over the 14 issues. The second is the sum of the intensity of disagreements over the 14 issues. The third and fourth consist of composites of items from those scales. The frequency of disagreement (F_i) reported for each issue was weighted by the intensity of disagreement (N_i) for that issue. I then summed the products of $F_i \times N_i$ obtained for each issue. Finally, I added each F_i to its corresponding N_i and summed the resulting $F_i + N_i$ for the 14 issues. Brown and Day developed the $F \times N$ and $F + N$ measures; they contended that the composites contained more information on the interaction between the units of a relationship than a single measure of manifest conflict. However, adding the scores is much less well grounded conceptually than is multiplying them.[3]

Table 1 shows the intercorrelations among the four measures of manifest conflict. The measures are moderately intercorrelated because they measure

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[2] In a parasimulation, Hunger and Stern (1976) used written interorganizational communications to measure manifest conflict. One anonymous reviewer of the present study suggested that the ideal measure of manifest conflict is a series of careful observations by a researcher of interaction between antagonists. However, the task of either monitoring communications or observing the interaction between antagonists is so immense that it is virtually impossible to accomplish, except in a laboratory.

[3] Summing the responses over the 14 issues to obtain an index of the frequency of disagreements (F) and an index of the intensity of disagreement (N) may result in overlooking some revealing and interesting off-diagonal cases, such as respondents high on the frequency of disagreement and low on the intensity of disagreement, or those low on frequency and high on intensity. In this data set, there were no such cases among the respondents. This finding is attributable in part to the small size of the sample and in part to the fact that the ventures examined were still functioning. If off-diagonal cases had been present, I could have partitioned each of the F and N measures at the neutral point to obtain a high F index, a low F index, a high N index, and a low N index.

the same construct, defined over the same set of issues and taken from the same sample. However, because of their conceptual differences, I evaluated each separately.

EVALUATION OF THE MEASURES

The four alternative measures were compared in terms of reliability, nomological validity, and convergent validity (Campbell & Fiske, 1959). Appropriate data were not available for assessing discriminant validity and concurrent validity.

Unidimensionality

Each was expected to be unidimensional. I conducted a principal components factor analysis on the reliable items that remained after testing each measure for Cronbach's alpha. The degrees of freedom available in the data set were less than ideal for this kind of analysis. The first factor alone accounted for 71.3, 73.4, 79.9, and 74.4 percent of the total variance in the F, N, $F \times N$, and $F + N$, respectively. Thus, each measure seemed unidimensional.

Reliability

Each of the four measures was tested for reliability. Alphas for F, N, $F \times N$, and $F + N$ were 0.84, 0.82, 0.83, and 0.81, respectively. Thus, each measure seemed adequately reliable.

Validity Assessment

Churchill (1979) suggested that in order to assess the construct validity of a measure, a researcher must determine convergent, discriminant, and nomological, or criterion, validity.

Convergent validity is indicated when two maximally different measures of the same construct are highly correlated. Each respondent was asked to rely on his recollection to provide a rating of (1) the overall level of frequency of expressed disagreements (F'), and (2) the overall level of the intensity of expressed disagreements (N') between the partners in a joint venture. I combined the two single-item overall measures into two complex single-item measures ($F' \times N'$) and ($F' + N'$). According to Brown and Day (1981), such single-item measures and their multiitem-measure counterparts are substantially, although not maximally, different. Thus, correlating each measure with its counterpart—F with F', N with N'—provides a measure of convergent validity. The correlation coefficients for F with F', N with N', $F \times N$ with $F' \times N'$, and $F + N$ with $F' + N'$ were 0.80, 0.75, 0.83, and 0.77. Each of the four correlation coefficients was statistically significant at a level beyond 0.0001, which yields limited, but supportive, indication of convergent validity.

The nomological validity of the four proposed measures can be confirmed if they relate to other constructs according to an established body of theory (Peter, 1981). The marketing literature shows that manifest conflict

relates negatively to the degree of satisfaction of a member of a marketing channel with the performance of a reciprocal member (Rosenberg & Stern, 1971) and to the member's degree of satisfaction with various aspects of the relationships (Lusch, 1977). In the same vein, marketing theory also suggests that manifest conflict relates positively to the number of desired changes in the programs and policies of a joint venture (Rosenberg & Stern, 1971) and the level of perceived conflict (Brown & Day, 1981).[4]

Respondents provided ratings of their degree of satisfaction with the performance of their joint venture partners, the degree of satisfaction with the various aspects of the venture, the number of changes they desired in the programs and policies of the venture, and the level conflict they perceived in the venture.

Table 2 shows the Pearson product-moment correlations, with their associated p-values, for each of the four measures of manifest conflict with (1) two negatively related constructs of satisfaction and (2) two positively related constructs of the number of desired changes and the level of perceived conflict. Results for the four measures were as expected. The measure of frequency, F, seems to have the highest correlations with the negatively related variables, followed closely by $F \times N$. However, $F \times N$ seems to have the highest correlations with the positively related variables, followed by F. In sum, the four measures of manifest conflict rank in terms of their relationships to other variables as follows: $F \times N$ and F tied for first position, followed by $F + N$ and then N. Brown and Day (1981), who conducted a similar study on automobile franchises, found that $F \times N$ ranked the second highest, followed by $F + N$, N, and F. In their study, the best measure of manifest conflict was a multiplicative measure of importance of an issue times the

TABLE 1
Intercorrelations Among Measures

Measures	Means	Standard Deviations	2	3	4
1. F	4.614	0.2766	.892	.763	.711
2. $F \times N$	16.803	2.3754		.835	.780
3. $F + N$	8.102	0.3748			.726
4. N	3.647	0.1959			

[4] A marketing or distribution channel is an interorganizational system composed of a set of interdependent institutions, such as wholesalers and retailers, and agencies, such as advertising agencies, involved in the task of moving things of value from points of conception, extraction, or production to points of consumption (Stern & El-Ansary, 1977).

A joint venture is similar to a corporate vertical marketing system that owns the successful stages of production and distribution. A venture either distributes its products itself, with each of the partners profiting according to its equity share, or according to the terms of a partnership contract.

TABLE 2
Correlations of Proposed Measures with Selected Constructs

Measures of Manifest Conflict	Satisfaction with Partner's Performance[a]	Satisfaction with Aspects of Joint Venture[a]	Number of Desired Changes[b]	Perceived Conflict[b]
Frequency of disagreement (F)				
r	−.43	−.26	.45	.51
p	.003	.05	.002	.001
Intensity of disagreement (N)				
r	−.24	−.23	.37	.46
p	.07	.07	.01	.002
Sum (F + N)				
r	−.36	−.23	.44	.47
p	.01	.07	.003	.001
Product (F × N)				
r	−.42	−.25	.52	.59
p	.004	.06	.000	.000

[a] Existing theory suggests a negative relationship with manifest conflict.
[b] Existing theory suggests a positive relationship with manifest conflict.

frequency of disagreement times the intensity of disagreement. In this study, the importance of an issue appeared to be a redundant measure because the intensity of disagreement depended on the importance of the issue over which partners disagreed. The intensity dimension captured and encompassed the importance dimension.

Future research should investigate manifest conflict in settings in which conflict is pervasive, such as international franchising, international licensing, and international relations. Investigators should also examine manifest conflict in multinational joint ventures from host firms' perspectives, from foreign firms' perspectives, and from a combined perspective, as expressed in dyadic relationships. Finally, relationships between manifest conflict and other behavioral phenomena like leadership, power, dependence, satisfaction, performance, and tolerance for dominance in different organizational settings warrant research attention.

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APPENDIX

Respondents were requested to rate the following 14 items on two scales. The first employed a 6-point format anchored by "constantly" and "never" and asked about the frequency of disagreement about the items. The second, with 5-point format from "very high" to "very low," asked about the intensity of disagreement about the items.

1. Separating the operations of the joint venture from those of the parent companies.[a]
2. Prudence of committing a large proportion of a joint venture's outputs to a parent company.[a]
3. Prudence of procuring much of the input needs of the joint venture from either of the parent companies.[b]
4. A partner's attempt to make changes in the terms of the joint venture's contract.
5. A partner's attempt to control key decisions in the joint venture.
6. Differences of opinions regarding the amount of profit to be retained in the joint venture.
7. Differences of opinions regarding expanding the joint venture or maintaining it at a certain size.
8. Differences regarding accessibility to update technology from a parent company.
9. Differences regarding the pricing of an input provided by a partner in the joint venture.
10. Differences of opinions regarding product proliferation (e.g., what to produce in the future).
11. Differences regarding the roles and functions to be performed by each partner in the joint venture.
12. Differences regarding hiring policies in the joint venture.
13. Differences regarding the interpretations of the terms of the joint venture contract.
14. Differences regarding the division of benefits between the partners.

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[a] No α for F or $F + N$ was calculated for the item.
[b] No α for N or $F \times N$ was calculated for the item.

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PERSON CHARACTERISTIC VERSUS ROLE CONGRUENCY EXPLANATIONS FOR ASSESSMENT CENTER RATINGS

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Ratings from assessment centers can consistently predict such subsequent performance criteria as rate of future salary increases, promotions, and supervisory ratings of performance and potential for entry-level management (Thornton & Byham, 1982). In assessment centers, exercises and simulations are used to generate examples of candidates' behaviors, and assessors base dimensional and overall ratings on those behaviors. Unfortunately, little is known about why ratings from assessment centers have predictive value or what it is that they measure (Klimoski & Strickland, 1977; Neidig & Neidig, 1984; Sackett & Dreher, 1984). The literature on assessment centers offers two competing explanations. In the *person characteristic* model, assessment centers are seen as generating candidate behaviors that correspond directly to underlying, causal personal characteristics, skills, and abilities. According to those who design assessment centers, conceptual definitions of assessment dimensions represent a candidate's specific characteristics (Byham, 1970; Holmes, 1977).

In their formulation of the *role congruency* explanation, Sackett and Dreher (1982, 1984) hypothesized that assessors' ratings reflect the degree to which candidates' behavior is congruent with managerial role expectations within a particular exercise. Instead of reflecting a candidate's characteristics, ratings indicate how well a candidate fits expectations of what a hypothetical good manager might do in a given exercise. The question then becomes: Do assessment centers measure (1) a person's characteristics or (2) how well a person behaves like a manager in the eyes of an assessor?

The two explanations have different implications for development of a theory of managerial selection and lead to competing predictions. If personal characteristics constitute the major source of variation in dimensional ratings, ratings of the same dimension across different exercises should be correlated, and ratings made on different dimensions within the same exercise should not be correlated. If the major source of variation is how well a candidate plays the part of a manager in different exercises, ratings within an exercise across dimensions should be more highly correlated than ratings of the same

dimension across exercises. A number of investigators have reported evidence supporting a role congruency explanation (Archambeau, 1979; Neidig, Martin, & Yates, 1978, 1979; Sackett & Dreher, 1982; Sackett & Harris, 1983; Silverman, Dalessio, Woods, & Johnson, 1986; Turnage & Muchinsky, 1982).

Though assessment center architects still adhere to the person characteristic model (Neidig & Neidig, 1984), no researcher has reported results supporting it. However, there have been challenges to results supporting the role congruency model. Neidig and Neidig (1984) argued that convergence of different dimensional ratings within a single exercise can be interpreted as support for an exercise-specific characteristic like skill at handling a simulated in-basket or interview. The only way to test this alternative explanation is to introduce a third measure of either (1) role congruent behavior or (2) person-specific, rather than exercise-specific, skills and abilities. Convergence of a role congruent behavioral measure with exercises requiring that particular type of behavior would support the role congruency explanation. Convergence of a person-specific skill or ability measure with ratings made on individaul dimensions across exercises would support the person characteristics explanation.

The current study contains two sources of information: (1) six dimensional ratings made after two exercises and (2) self-ratings of effective interpersonal behaviors for 75 candidates being considered for entry-level management positions. The self-ratings represent a measure of behaviors congruent with the role of manager. The measure is useful in this application because a large literature exists indicating that no single personal characteristic, skill, or ability underlies the self-reported behaviors it assesses (Ford & Tisak, 1983). If a role congruency explanation fits, the measure of effective interpersonal behavior should be most highly correlated with postexercise dimensional ratings that come from an exercise requiring interpersonal interaction, such as an interview simulation. If a person characteristic explanation fits, the effective behavior measure should be more highly correlated with ratings on those dimensions that correspond most closely with interpersonal behavior, such as sensitivity, regardless of the exercise on which the rating was based.

METHODS

Participants and Procedures

Assessment center ratings were obtained from a *Fortune* 500 company in the summer and fall of 1984. Current employees of divisions located all across the continental United States either nominated themselves or were nominated by their immediate supervisors to participate in an assessment center. There were 75 participants, 35 percent of whom were women; their average age was 28 years and their average job tenure was 4 years.

The participants were all candidates for entry-level managerial positions. The procedure required four assessors to make ratings on 9 to 12 dimensions across four or five exercises. The type and number of exercises and dimen-

sions depended on the specific job for which an individual was a candidate. For instance, the assessments for sales manager and manufacturing supervisor differed on one exercise and two dimensions. Assessors individually observed candidates' behaviors, rated them on all 9 to 12 dimensions after each exercise, and arrived at an overall rating for the exercise. Thus, four exercises and 9 dimensions would yield 36 postexercise dimensional ratings per assessor, in addition to one overall rating for each of the four exercises. Discussion to achieve consensus and overall dimensional ratings followed each exercise. Finally, assessors arrived at their own overall assessment ratings for each candidate and then discussed each candidate to arrive at a final, consensual overall assessment rating.

Analyses are limited to postexercise dimensional ratings made on in-basket and interview simulations because they were the only two exercises used consistently across all centers. Six dimensions were rated in common across the two exercises: oral communication skills, sensitivity, planning and organization, management control, information gathering, and decision making. Appendix A presents conceptual definitions of the dimensions as well as a brief description of the in-basket and interview simulation exercises.

Effective Interpersonal Behavior

A number of research efforts directed at measuring a personal-skill-and-ability construct labeled social intelligence occurred 50 years ago, in conjunction with ongoing developments in the area of intelligence testing (Broom, 1928, 1930; McClatchy, 1929; Thorndike, 1920, 1936). These efforts were noteworthy for their failure (Ford & Tisak, 1983). More recently, Ford and his colleagues (M. E. Ford, 1983, 1985, in press; Ford, Burt, & Bergin, 1984; Ford & Tisak, 1983) have developed measures of the interpersonal processes or behaviors that people engage in to achieve various social goals. Because achieving organizational goals through others is a primary managerial role, I viewed effective interpersonal behavior as a role requirement for effective managers. The scale used in the present study was a modified form of the self-rating version used in previous research (Ford, 1985; Ford et al., 1984). Candidates were asked to describe how well they do in 24 different interpersonal situations with co-workers. Responses could range from 1 = not at all good to 6 = extremely good.

A common factor analysis yielded seven factors with eigenvalues greater than 1. As scree test and visual interpretation of the interfactor correlations indicated that a three-factor solution might be more parsimonious. The three-factor solution, which employed a loading rule of .40 on the major factor and .30 at most on all others, generated clean factor loadings in the factor pattern matrix. The average loadings on major and minor factors were .65 and .18. Table 1 contains the factor pattern matrix, and Appendix B describes the items and their development.

The factors are almost identical to those that Ford and his colleagues reported (M. E. Ford, 1985, in press; Ford et al., 1984). They used the same items phrased to reflect a nonwork social setting. Ford (1983, 1985) saw the

TABLE 1
Factor Pattern Matrix
for the Effective Interpersonal Behavior Scale

	Factors		
Items[a]	1	2	3
Morality-related			
1	.83	.29	.21
2	.78	.26	.28
3	.92	.19	.27
4	.61	.20	.28
5	.55	.21	.29
6	.41	.29	.20
Independence-related			
1	.28	.75	.25
2	.27	.55	.29
3	.23	.54	.27
4	.26	.49	.22
5	.28	.60	.25
6	.28	.60	.25
Friendship-related			
1	.22	.26	.66
2	.24	.28	.78
3	.22	.24	.83
4	.23	.26	.85
5	.16	.28	.74
Eigenvalues	7.2	4.3	3.8

[a] Appendix B describes the numbered items in each scale.

three factors—designated prosocial, self-efficacy, and instrumental—as reflections of the implicit frameworks people use to categorize social behavior. I labeled the three factors morality-related behavior, independence-related behavior, and friendship-related behavior. The items loading on the three factors had standardized alpha coefficients of .83, .83, and .76, respectively. For the entire effective interpersonal behavior scale, $\alpha = .92$. The average interfactor correlation was .30, and the highest correlation was between the morality and friendship factors ($r = .35$).

Participants took the scale before going to an assessment center. People who were not associated with the local assessment center administered and collected the questionnaire, which was titled the "University Study of Managerial Skills."

A final measurement issue was the possibility of leniency bias in candidates' self-ratings on the behavioral scales. The centers were not used as a diagnostic tool to identify shortcomings but as a selection device. Candidates who received unfavorable evaluations in assessment were rarely considered further for promotion. With limited opportunity for reassessment, it was to the candidates' advantage to make sure they were at their best.

To minimize that potential bias, the instructions indicated that the purpose of the questionnaire was to help future candidates determine whether they were ready for assessment or whether they should postpone it until they had an opportunity to address shortcomings. The instructions also emphasized that their responses to this questionnaire would not be used by any assessor or in any administrative decisions concerning their own employment status. The range of average responses to the scale items was 3.62 to 4.29. The range of standard deviations for item responses was 1.82 to 2.44. It appeared that, although a constant positive bias might characterize responses to items, there was adequate variance to warrant examination.

ANALYSES AND RESULTS

Table 2 contains the means and standard deviations of all variables as well as all intercorrelations. A, B, and C represent a multitrait, multimethod (MTMM) correlation matrix comparable to those reported in previous studies. The average correlation among dimensions evaluated by the in-basket exercise (heterotrait-monomethod in A) was .53. The average correlation among dimensions evaluated by the interview simulation (heterotrait-monomethod in C) was .52. The average monotrait-heteromethod correlation was .25, and the average heterotrait-heteromethod correlation was .19 (B). These findings replicate those reported by Sackett and Dreher (1982) and Sackett and Harris (1983), though the absence of heterotrait-heteromethod convergence could be due to a context effect. Of particular interest are the correlations between the effective interpersonal behavior scales and the postexercise dimensional ratings. Although only 2 of the 28 correlations with in-basket exercise ratings achieve significance, 12 of the 28 correlations with interview simulation ratings achieve significance.

DISCUSSION

The findings presented here extend previous findings in support of the role congruency model. No support emerged for Neidig and Neidig's (1984) alternative explanation of an exercise-specific skill or ability. The convergence of the behavioral scales with dimensional ratings based on an interview simulation, which required candidates to demonstrate interpersonal behaviors, and an in-basket exercise, which did not require interpersonal behaviors, provides support for the role congruency explanation of assessment center ratings. Postexercise dimensional ratings failed to demonstrate convergent and discriminant validity in the MTMM analysis. As reported in prior research, dimensional ratings converge within exercises and discriminate between exercises.

It is also of interest that all but three of the correlations between the behavioral scales and interview simulation ratings are negative. Self-ratings of effective interpersonal behavior with peers are negatively related to assessors' ratings of behavior in the interview simulation. If both sets of ratings are construct-valid measures of interpersonal role requirements, the

TABLE 2
Means, Standard Deviations, and Correlations [a]

Variables	Means	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Effective interpersonal behavior																			
1. Morality	4.1	1.82																	
2. Independence	3.6	1.95	31																
3. Friendship	4.3	2.44	35	25															
4. Overall	4.0	2.01	52	56	49														
In-basket exercise																			
5. Oral communication skill	2.2	0.96	11	13	26*	-03													
6. Sensitivity	2.5	1.00	13	-14	06	-03	55												
7. Planning/organization	2.6	1.05	13	14	-11	05	60	43											
8. Management control	2.4	0.91	06	08	01	03	48	43	46										
9. Information gathering	2.3	0.82	-06	09	-21*	-03	39	44	45	59									
10. Decision making	2.5	0.95	13	13	-18	02	62	56	53	70	61								
11. Overall	2.5	1.01	09	12	-13	01	50	50	56	45	50	79							
Interview simulation																			
12. Oral communication skill	2.1	0.87	00	-03	-17	-10	20												
13. Sensitivity	2.1	1.12	07	-37**	-14	-27*	19	25						42					
14. Planning/organization	2.0	1.01	21*	-21*	-40**	-35*	17	20	29					71	50				
15. Management control	1.9	0.88	-05	-13	-04	-02	15	12	20	27				60	52	50			
16. Information gathering	2.6	0.93	-17	-14	-47**	-32*	22	11	22	26	26			51	61	47	39		
17. Decision making	2.4	0.97	-11	-17	-41**	-30*	23	10	23	20	19	26		49	41	53	70	40	
18. Overall	2.1	0.95	-12	-15	-30*	-21*	24	19	24	18	19	17	25	46	52	60	62	44	54

A^b is the heterotrait-monomethod matrix within the in-basket exercise block. B^b is the heterotrait-heteromethod matrix. C^b is the heterotrait-monomethod matrix within the interview simulation block.

[a] N = 75.
[b] A, C = heterotrait-monomethod matrix; B = heterotrait-heteromethod matrix.
* p < .05
** p < .01

findings suggest that assessors may view behavior indicating good peer relations at nonmanagerial levels as detrimental to good superior-subordinate relations. Although the finding is of obvious practical and theoretical interest in the area of managerial development, further research examining relationships between self-, peers', and superiors' perceptions of effective interpersonal behavior is needed.

Assessment center architects have been premature in concluding that postexercise dimensional ratings reflect underlying personal characteristics that cause behaviors observed in assessment centers. Ten years ago Klimoski and Strickland (1977) raised concerns about the construct validity of assessment center ratings, asking whether they predict performance or how well candidates conform to a given set of role expectations held by assessors. This study adds to the considerable body of research findings indicating the latter.

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APPENDIX A
Definitions of Assessment Dimensions

The dimensions rated by assessors examined in this study included the following:
1. Oral communication skills – ability to effectively present information orally.
2. Sensitivity – ability to perceive subtle cues in behaviors of others.
3. Planning and organization – ability to allocate or assign, sequence, and coordinate resources to achieve a goal or objective.
4. Control – ability to develop and maintain sources, procedures, and mechanisms to become and remain informed of important matters.
5. Information gathering – ability to interact with others in ways necessary to gather important information.
6. Decision making – ability to make high quality decisions.

The exercises in which participants engaged were:
1. In-basket – Candidates receive a package of background materials and problems, specific to the type of job for which they are being considered, with predetermined relationships, decision requirements, and priorities. Candidates have a specific time period within which to assume the role of a responsible administrator.
2. Interview simulation – Candidates play a role structured around an interview situation that might occur on the target job. For a position in sales management, it involved a face-to-face interaction with an unhappy customer; for the position of manufacturing supervisor, it involved discussing a performance problem with a subordinate.

APPENDIX B
Effective Interpersonal Behavior Scale

The work of Ford and his colleagues was the basis for the development of the scales used in this study. Ford and Miura (1983) took an implicit approach, asking people to describe the most socially competent person they knew. Cluster analysis of subsequent codings of those descriptors yielded four major components underlying peoples' conceptions of social competency: (1) prosocial behavior — sensitive to the feelings of others, dependable, socially responsible, respectful of other people's rights and viewpoints, interested in other people; (2) instrumental behavior — knows how to get things done, likes to set goals, communicates well; (3) social ease — opens up to people, adapts socially, is involved and enjoys social activities; and (4) self-efficacy — has own values and identity, a good outlook and self-concept.

D. H. Ford (in press) also took an explicit approach based on the social motivation literature and "living systems theory." He identified eight categories of self-assertive and integrative behavioral competencies in social settings. The integrative competencies dealt with behaviors maintaining and promoting the well-being of other individuals and groups. However, using peer nominations, teacher ratings, and self-evaluations with high school students, M. E. Ford (in press, 1985) and Ford and his colleagues (1984) found convergent evidence of the three implicit categories of prosocial, instrumental, and self-efficacy behavior. The findings reported in Table 1 support these implicit categories. The items for the three subscales are listed below:

Morality-related behavior:
1. Some people are good at following through when they say they'll do something for a co-worker, but other people are not so good at this.
2. Some people are good at treating co-workers equally, even those with very different beliefs or characteristics, but others are not so good.
3. Some people are good at responding to the needs of their co-workers, but other people are not so good.
4. Some people are good at keeping their commitments to their co-workers, but others are not so good at this.
5. Some people are good at giving everyone an equal opportunity to state their opinion when making a group decision, but other people are not so good at this.
6. Some people are good at sticking to agreements they have made with their co-workers, but other people are not so good at this.

Independence-related behavior:
1. Some people are good at resisting group pressure when making choices, but other people are not so good at this.
2. Some people are good at developing their own way of doing things, but other people are not so good at this.
3. Some people are good at doing what they want even when their co-workers want them to do something else.
4. Some people are good at coming out ahead in most comparisons with their peers, but other people are not so good at this.
5. Some people are good at maintaining their own identity within a group, but other people are not so good at this.
6. Some people are good at forming their own individual viewpoints, but other people are not so good at this.

Friendship-related behavior:
1. Some people are good at helping their co-workers get through hard times, but other people are not so good at this.
2. Some people are good at finding a co-worker who can make them feel better when they are lonely or depressed, but other people are not so good at this.
3. Some people are good at finding a co-worker who will stand by them when they have a problem, but other people are not so good at this.

4. Some people are good at helping their co-workers feel good about themselves, but other people are not so good at this.
5. Some people are good at getting their co-workers to help them with their work, but other people are not so good at this.

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USING MULTIPLE ATTRIBUTES TO ASSESS SOURCES OF PERFORMANCE FEEDBACK

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Feedback on employees' performance in work organizations has long been recognized as important for the learning and maintaining of work-related behaviors (Ashford & Cummings, 1983; Ilgen, Fisher, & Taylor, 1979; Taylor, Fisher, & Ilgen, 1984). However, as Ilgen and colleagues noted, "Generalizations about the effects of feedback on individuals are few" (1979: 349). In their review, those investigators concluded that one major reason for the scarcity of generalizable conclusions is that researchers have paid little attention to differences in sources of feedback.

Previous attempts to address such differences have focused on identifying salient sources of feedback in work environments and on the amount and nature of the information that each source provided. Greller and Herold (1975) and Hanser and Muchinsky (1978) found differences in the perceived informativeness of five sources of performance feedback; the sources were formal organizations, co-workers, supervisors, tasks themselves, and focal individuals' own feelings and ideas. Using factor analysis, Hanser and Muchinsky (1978) and Herold and Greller (1977) demonstrated the existence of separate factors representing different sources of feedback.

Although the amount of information provided by feedback sources is important, other attributes of sources are also relevant (Guetzkow, 1965; Porter & Roberts, 1976). Examining such other attributes, Hanser and Muchinsky (1978) reported differences in the perceived reliability of information from different sources, and Greller (1980) reported differences in the perceived usefulness of information from different sources.

Thus, it appears that sources of feedback are conceptually distinct, and that frequency of occurrence, consistency or reliability, and usefulness to recipients are relevant attributes of feedback. However, no one study has simultaneously examined these multiple attributes of feedback as they emanate from different sources.

The main purpose of this study was to examine whether individuals differentiate between feedback sources on the basis of the perceived usefulness and reliability of the information they provide. We also reassessed differentiation in terms of amount of feedback. Specifically, we were interested in whether qualitatively assessing sources of feedback in terms of frequency, consistency, and usefulness would yield the same ordering of sources that previous assessments of amount of feedback only have revealed. Ranked from the greatest to the smallest amount of feedback, that order has been self, task, supervisor, co-workers, and organization. A second purpose of the study was to investigate the psychometric characteristics of composite scales measuring those three attributes of feedback sources and to test the cross-sample stability of any such derived scales.

A final purpose was an exploratory examination of the construct validity of such multiattribute measures of feedback. We examined the relationship of such composite measures to several outcome variables of interest. The following relations were examined: (1) Lack of performance feedback is generally considered to induce uncertainty. Thus, a measure of the overall quality of feedback, reflecting frequency, reliability, and usefulness, should be positively related to liking feedback and negatively related to three correlates of uncertainty—role ambiguity, stress, and thoughts about leaving a job (Taylor et al., 1984). (2) The widely used Job Diagnostic Survey (JDS) (Hackman & Oldham, 1975) distinguishes between "feedback from agents" and "feedback from job." Thus, those feedback sources that could be construed as agents, such as supervisors and co-workers, and those that could be construed as aspects of a job, such as task and self, ought to exhibit theoretically consistent correlations with those two JDS dimensions.

METHODS

Data were collected from two field sites. The first site, an industry trade association, provided 102 individuals, who represented 93 percent of all employees across all functional and hierarchical levels. Women accounted for 40 percent of the individuals. The average age of all respondents was 34.6 years. At the second site, an electric utility, respondents were 50 supervisors from all departments. The group included only men. Their average age was 35.2 years. Respondents completed all questionnaires on company time, anonymously, in small groups, with the senior author present to answer any questions.

Respondents in both groups were asked to complete questionnaires that included 15 items designed to measure perceptions of feedback received from different sources. The items appear in the Appendix. The instructions

included an introduction noting that there are many ways in which people can find out how well they are doing their jobs and asking respondents to think about how much information they obtained from each of the sources, how useful such information was for improving their performance when they did receive it, and the consistency with which they could count on getting such information from each of the five sources. The sources listed were the formal organization for which they worked, their supervisor, co-workers, the performance of a task itself, and their own feelings and ideas. All ratings were on 7-point scales.

For the individuals who worked at the trade association, we collected additional data. We assessed intentions to leave with a single item, "I have thought about quitting." Role ambiguity was measured with six items developed by Rizzo, House, and Lirtzman (1970; $\alpha = .72$). We used nine items to tap mental stress ($\alpha = .85$); "I am unable to think clearly" is an example. Feedback from agents ($\alpha = .83$) and feedback from the job ($\alpha = .73$) were each measured using three items from the JDS. Finally, we developed five single-item measures asking people how much they liked getting feedback from each of the sources.

RESULTS

Factor Analysis of Attributes of Feedback Sources

Ratings of all attributes for each of the five feedback sources from the trade association employees were factor-analyzed using a principal components solution with varimax rotation. We chose to report a five-factor solution because: (1) it met Kaiser's criterion (eigenvalue ≥ 1) and was supported by a scree test (Cattell, 1962) for the plot of eigenvalues, (2) it accounted for a substantial portion of the variance (73.5%), and (3) the items factored cleanly by source of feedback, thus providing conceptual clarity.

As Table 1 shows, the five factors clearly reflect the five feedback sources. Although the subject-to-item ratio for this analysis was lower than that which is sometimes recommended, an examination of the factor structure and the absence of cross-loadings provide support for the interpretation that each factor represents multiple attributes of the same feedback source. Furthermore, it is noteworthy that task and self-feedback did not load on one factor. Previous research (Hanser & Muchinsky, 1978; Herold & Parsons, 1985) has raised the question of whether those two sources are distinguishable.

Feedback Source Scales

The intercorrelations of the attributes of feedback sources within each group of respondents reveal very similar patterns. The three attributes are fairly highly correlated for each source, suggesting that as the frequency of feedback increases, perceptions that a source's feedback is available consistently and is useful also increase. Average intercorrelations for the three attributes for the trade association employees were .50, .59, .69, .68, and .42

TABLE 1
Rotated Factor Matrix for Feedback Attributes

| Sources | Factors | | | | |
Feedback Attributes	1	2	3	4	5
1. Supervisory					
Amount	**.88**	.05	.18	−.04	−.02
Usefulness	**.76**	.10	.28	.15	.01
Consistency	**.76**	.05	.15	.17	−.03
2. Task					
Amount	−.01	**.97**	.18	.03	.15
Usefulness	.14	**.60**	.08	.18	.27
Consistency	.08	**.78**	−.07	.09	.32
3. Co-workers'					
Amount	.14	.05	**.82**	.07	.11
Usefulness	.23	−.02	**.81**	.19	.09
Consistency	.25	.13	**.56**	.07	−.17
4. Organizational					
Amount	−.01	.14	.09	**.81**	.02
Usefulness	.07	.14	.19	**.84**	−.07
Consistency	.14	−.02	.03	**.44**	.14
5. Self					
Amount	.11	.23	.06	.01	**.55**
Usefulness	−.18	.10	.01	.11	**.82**
Consistency	−.01	.25	−.04	.01	**.52**
Eigenvalues	4.00	2.77	1.71	1.34	1.21
Percentages of common					
variance explained	26.7	18.4	11.4	8.9	8.0

for organizational, co-workers', supervisory, task, and self-feedback, respectively; for supervisors at the public utility, these intercorrelations were .69, .55, .75, .51, and .25. The correlations between attributes were lower for self-feedback in both groups, suggesting that perceptions of attributes of self-feedback may be more highly differentiated, with individuals providing such feedback to themselves irregularly or finding that such efforts vary in their usefulness.

Table 2 shows the results of combining the three attributes into a composite for each of the five feedback sources. It also shows the internal consistencies, means, standard deviations, and intercorrelations for the resulting scales and for the other variables in the study.

The data in Table 2 have several implications. It appears that feedback from the five sources can be reliably assessed using the three attributes of amount, consistency, and usefulness (α = .68–.91, except α = .49 for self-feedback in the public utility group). The means for the scales in both groups replicate the pattern of monotonic increases in amount of feedback found by previous research. Planned comparisons (Keppel, 1973) for the trade association data showed all means to be significantly different (p < .05) from each other, and they followed the predicted ordering of feedback sources, with ratings of individuals themselves being the highest, tasks being the next

TABLE 2
Reliabilities, Descriptive Statistics, and Intercorrelations for Feedback Scales and All Other Variables[a]

a) Trade Association

Variables	α	Means	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Organizational feedback	.73	2.86	1.54														
2. Co-workers' feedback	.80	4.02	1.41	25													
3. Supervisory feedback	.86	4.72	1.57	16	44												
4. Task feedback	.86	5.15	1.31	22	18	19											
5. Self-feedback	.68	5.79	0.93	11	08	00	44										
6. Liking organizational feedback		4.86	1.69	41	06	04	23	02									
7. Liking co-workers' feedback		5.42	1.46	08	47	15	02	00	28								
8. Liking supervisory feedback		5.89	1.67	07	27	45	18	−09	38	19							
9. Liking task feedback		6.05	1.16	14	−05	07	51	29	47	11	22						
10. Liking self-feedback		6.19	1.10	−03	17	09	13	50	15	18	10	41					
11. Role ambiguity	.72	15.89	5.58	−28	−23	−45	−26	−23	−11	−19	−15	−12	−12				
12. Thoughts about quitting		2.96	1.95	−27	−30	−19	−09	00	−06	−10	−26	−04	−03	27			
13. Mental stress	.85	6.09	4.93	−17	−34	−29	−27	−08	−19	−13	−42	−20	−14	31	45		
14. Feedback from agents	.83	4.52	1.49	04	39	64	14	−01	05	22	37	14	11	−35	−15	−33	
15. Feedback from the job	.73	5.18	1.14	30	13	16	72	38	33	07	21	44	11	−24	−18	−24	16

b) Public Utility

Variables	α	Means	s.d.	1	2	3	4
1. Organizational feedback	.86	3.43	1.72				
2. Co-workers' feedback	.79	4.19	1.22	11			
3. Supervisory feedback	.91	4.29	1.50	−06	39		
4. Task feedback	.76	5.40	0.96	13	47	15	
5. Self-feedback	.49	5.51	0.63	16	08	05	37

[a] For (a) r > .18, p < .05; for (b) r > .27, p < .05.

highest, then supervisors, co-workers, and formal organizations. For the public utility group, although the means ascended in the predicted direction, two comparisons, of a possible ten, were not statistically significant. Those were between co-workers and supervisors and task and self.

Patterns of intercorrelations of the measures replicate very well across the two groups of respondents. Self-feedback and task feedback are significantly and positively related in both groups, but the correlations are low enough in terms of common variance to justify keeping the measures separate. Self-feedback is unrelated to any other feedback factors. Feedback from co-workers and feedback from supervisors are significantly, positively related. With one exception—the correlation between co-workers' and task feedback for the public utility supervisors—the remaining correlations are very low, suggesting a relative independence of the factors.

Data on the amount of information provided by each source were compared to the results obtained by Greller and Herold (1975) and Hanser and Muchinsky (1978). The amount of information from a source was the only data available for all three studies. The three studies used widely differing populations, including evening school students working full-time in various jobs, university faculty members, utility supervisors, and trade association employees at all organizational levels. As Figure 1 indicates, however, the pattern of means is remarkably similar in each study, as are the absolute values for each source. The only exception concerns Hanser and Muchinsky's study. The formal organization (a university) seemed to provide less information than did the other organizations. Standard deviations were not available across studies, so we could not test the statistical significance of that difference.

Initial Construct Validation

Table 2 reports the correlations between the composite measures of feedback and the outcome measures obtained for the trade association respondents. Liking feedback from a given source is significantly, positively correlated with the composite measures of feedback for all five sources, and role ambiguity is negatively correlated. Thoughts about quitting are significantly, negatively related to feedback from the organization, co-workers, and supervisors but not to feedback from self or task. Feedback from co-workers, supervisors, and task is significantly, negatively related to stress. The feedback-from-agents measure of the JDS is significantly and positively related to our co-workers and supervisor sources, and the feedback-from-job measure of the JDS is significantly, positively related to our task, self, and organizational sources. These relationships support the construct validity of the composite measures of the sources.

DISCUSSION

This study is another in a line of research demonstrating the viability of conceiving of workplaces as information environments (Ashford & Cummings,

FIGURE 1
Mean Informativeness Ratings for Different
Sources in Three Studies

Sources of Information
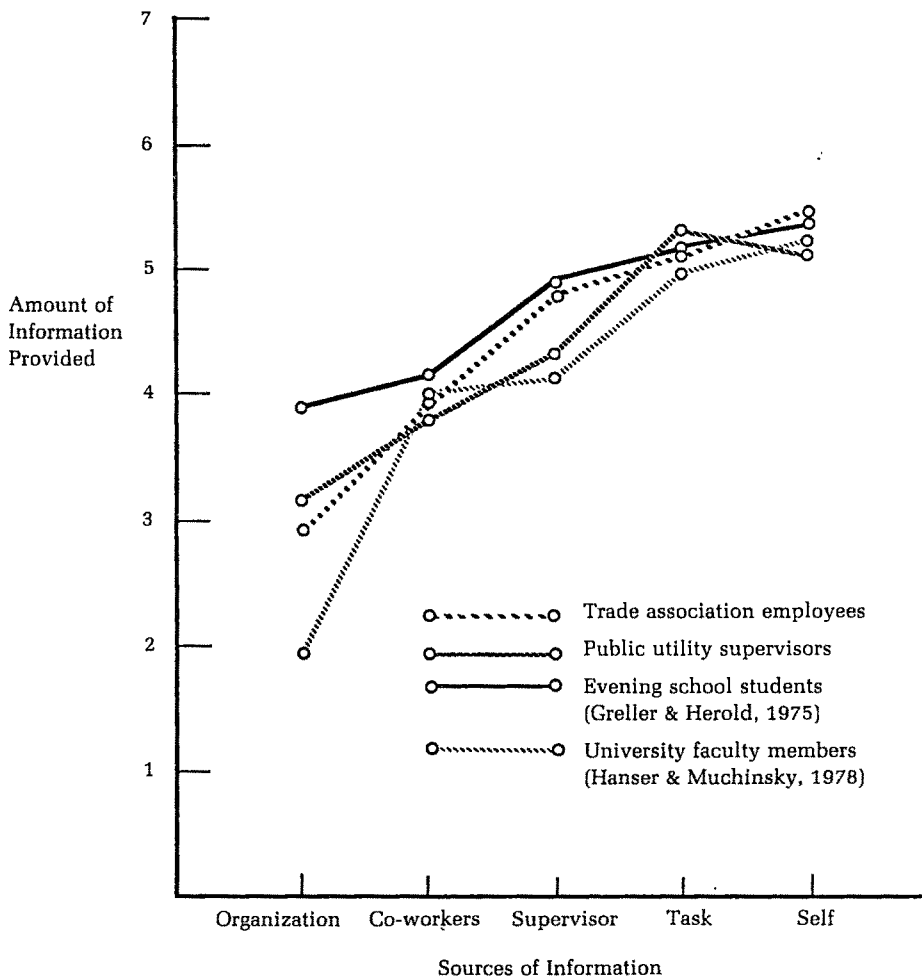
1983; Greller & Herold, 1975; Hanser & Muchinsky, 1978, 1980; Herold & Parsons, 1985). One aspect of any information environment is the type and nature of information sources it offers.[1]

We replicated previous research showing that five sources of feedback can be distinguished in work settings.[2] Previous studies have focused on the frequency or the amount of feedback generated by a source; results of the

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[1] The natures of messages and recipients are two other important aspects of an information environment.

[2] Although research has consistently identified five sources of feedback, in some work settings additional sources, such as clients, may be relevant.

present investigation indicate that the consistency and usefulness of the information generated are also important aspects of sources. It would seem that measures intended to assess sources of feedback should include those dimensions. Although the three attributes are significantly correlated, their common variance is low enough to suggest that each attribute makes a contribution towards capturing the source construct. Summing across the three attributes yields psychometrically stable measures that future research might use to assess the quality of feedback from different sources.

The results also show that the ordering of sources of feedback in terms of frequency, consistency, and usefulness is the same as the order, in terms of frequency alone, that has emerged through previous research. Individuals viewed feedback from formal organizations least positively. Feedback from co-workers was next, then feedback from supervisors, tasks, and finally, the individuals' own feelings and ideas. Since it is based on data from four groups of respondents in three studies using widely different settings and measurements, that order seems generalizable. We suggest that designers of organizational feedback systems should take it into account. Most such systems are based on the assumption that organizational and supervisory feedback constitute the feedback environment for organizational members. Little attention is paid to how individuals generate their own feedback, how they resolve contradictions between feedback sources, and, perhaps most important, how individuals might be taught and encouraged to generate accurate self-feedback.

The explorations of the relationships between existing measures of sources of feedback and other variables of interest serve a dual purpose. As well as supporting the construct validity of the new measures, they reinforce the theoretical and practical importance of research on performance feedback. As we predicted, performance feedback from various sources was positively related to liking feedback and negatively related to role ambiguity. If uncertainty is defined as the absence of information, feedback—from any source—reduces uncertainty. Similarly, if each source is thought of as a potential sender of role expectations, information from that source should reduce role ambiguity.

With respect to turnover and stress, feedback from all sources except self and task was negatively related to thoughts of quitting a job, while feedback from all sources except self and organization was negatively related to experienced mental stress. Further theoretical work might make differential predictions concerning the effects of feedback from a particular source on stress and turnover.

The JDS measures of feedback from agents and feedback from the job, perhaps the most widely used measures of feedback from two distinct sources, allowed us to predict and test a differential pattern of correlations. Feedback from agents was related to feedback from co-workers and supervisors but unrelated to feedback from organization, task, or self. Conversely, feedback from the job was related to organizational, task, and self-feedback, but not to feedback from co-workers or supervisors. Those theoretical consistencies are

reassuring and suggest that the five-source typology we employed may be more refined than the agents-job distinction. That is, it may be useful to distinguish between different agents as well as between different sources of job feedback. The results reported here provide initial validation of the feedback source construct we have delineated. However, extensions and replications of these findings in other organizations, as well as the study of additional outcome variables (e.g., performance), are necessary to further establish construct validity.

In summary, this study has extended previous work by demonstrating that improved, yet parsimonious, measures of sources of feedback can be obtained by tapping three attributes of an information sender, or communication source. Such an approach creates a psychometrically sound measure that seems to be stable across two very different groups of respondents from field sites. It may be more useful than previously used instruments for future investigations.

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APPENDIX

Each of three attributes of feedback was assessed for five sources. The complete wording of the first item is listed below. Other items were identical except for changes in the source as noted by the phrases given in parentheses.

Amount of feedback. Response alternatives ranged from 1 = provides almost no information to 7 = provides a great deal of information for the following: the company as a source of information about my job performance (my supervisor, my co-workers, my particular tasks and duties, my own feelings and ideas).

Utility of feedback. Response alternatives ranged from 1 = not at all useful to 7 = extremely useful for the following: the company as a source of useful information (my supervisor, my co-workers, my particular tasks and duties, my own feelings and ideas).

Consistency of feedback. Response alternatives ranged from 1 = not at all consistent to 7 = extremely consistent for the following: the extent to which the company is a consistent provider of information (my supervisor, my co-workers, my task, my own feelings and ideas).

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DIFFUSIBILITY OF BLAME: EFFECTS
ON PERSISTENCE IN A PROJECT

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Researchers have shown that people are more likely to continue allocating resources to failing projects when they have freely chosen the project.[1] According to theory, allocators who feel responsible for choosing a project that has failed continue to allocate resources hoping to justify their decision to enter the project rather than trying to maximize future revenues (Staw, 1981). The need to justify a decision replaces a strict economic criterion. Such a shift in decision criteria will, however, only affect allocations if a desire to maximize future revenues produces patterns of resource allocation that differ from the patterns produced by a desire to justify a prior decision.

Although an allocator's attempts to rationalize past behavior in the face of failure may result in increased resource allocations, a decision to continue a course of action may also depend on how an allocator can explain a failure. This study examined how a decision maker's ability to blame another party for a setback to a previously chosen project would affect the tendency toward continued allocation. Ability to diffuse blame should affect the justification process when allocators can claim that a setback occurred *in spite of* rather than *because of* their previous actions.

Shaver (1985) defined blame as a social account used to assign cause to a negative event. Research on escalation indicates that the ability to blame another party may arise in two ways. First, when a group makes an original choice of a course of action, individual group members can deny involvement in, and hence responsibility for, that choice. Although previous research (Bazerman, Giuliano, & Appleman, 1984) has shown that resource allocations made by groups were comparable to those made by individuals, they did not examine the effects of the group context on perceptions of responsibility or personal recommendations for continued allocations at an individual level. Second, some types of setbacks may provide a decision maker who is responsible for choosing a course of action with a way to deny all or part of the responsibility for a project's failure. A study by Staw and

Ross (1978) provided some indication that not only responsibility for the initial choice of a project but also the type of setback that occurs affects allocators. In that study, subjects made lower allocations following a setback attributable to corruption among government officials than they did following a setback attributable to the illiteracy of construction workers—even though both setbacks were foreseeable when they selected projects. Staw and Ross's results suggest that the opportunity to blame a setback on the negative or inappropriate actions of third party significantly decreases an allocator's desire to continue the support of a project in order to justify a previous decision.

HYPOTHESES

This study used two variations of a single setback—a labor strike—to investigate the effects of the diffusion of blame on commitment to a previously chosen course of action. In one case, the strike was not related to any action on the part of the decision maker; in the other case, the previous actions of the decision maker violated the terms of the labor contract and were just cause for the strike. The financial data available to subjects was consistent and indicated that continuation of the project would be the economically rational strategy.

Our central hypothesis was that when responsibility was low, an ability to diffuse blame would not affect allocations. However, we expected allocators with high responsibility to withdraw funds when they could diffuse blame for a setback and to continue funding when they could not. We further hypothesized that, regardless of diffusibility, allocators with low responsibility would be less likely to justify a previous decision through continued support of a project than would individuals with high responsibility. We induced high and low responsibility by manipulating the foreseeability of a setback. Figure 1 shows the form of the hypothesized interaction between responsibility and diffusion of blame.

In addition, in order to control for an effect observed by Staw and Ross (1978), where variation in the type of setback affected allocators' expectations regarding the likelihood that the setback would continue, we manipulated a third factor, setback persistence.

METHODS

Subjects and Procedures

Subjects were business students who volunteered for the study. There were 24 M.B.A. candidates with 1 to 10 years experience in their current jobs ($\bar{x}$ = 2.9) and 1 to 19 years in their current organizations ($\bar{x}$ =. 6.2). The remaining 43 subjects were third- and fourth-year undergraduates who had completed an introductory business core.[2] We randomly assigned subjects to

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[2] Because we observed no differences between the results obtained from the M.B.A. and undergraduate subjects, we combined the two groups in the data analysis.

FIGURE 1
Illustration of the Hypothesized Interaction
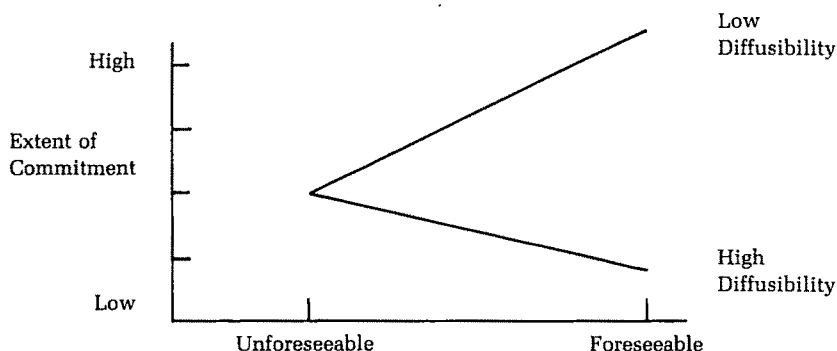
one of eight experimental conditions without controlling for education, experience, or gender.

Each subject received a package of materials that included a description of the role they were to take—vice president of a real estate development corporation—and a portfolio for two office projects under consideration for development by the firm. The portfolio contained reports from the company's contracting specialist, market analyst, and policy specialist and a financial pro forma detailing the development costs, the expected leasing rates, the projected cash flows, and the net-present-value analysis for two commercial real estate development projects.[3] The net-present-value analysis indicated that each project would provide positive economic returns to the firm. The Appendix contains the role description, the foreseeability induction, and an example of the financial analysis.

The information on the two projects was comparable across all dimensions. By eliminating any economic rationale or other objectively verifiable reason for selection, we expected to prevent systematic choice of one project over the other and to increase individuals' commitment regarding their selection.

The case materials stated that corporate policy required total development costs to be split across the construction horizon for any commercial project. Since the construction horizon for both projects was two years, subjects were advised to allocate half the total development costs to their selected project immediately. The materials further informed them that they would review their projects annually and make decisions regarding the allocation of the remaining development costs at the time of reviews.

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[3] The portfolio was modeled after those used by two real estate management firms in the southeastern United States.

The extent to which the setback was foreseeable was manipulated within the contracting specialist's report. For subjects in the *foreseeable setback* condition, the report stated that the masons' union and the firm had not reached agreement on the use of prefabricated construction techniques and that the issue was expected to create conflict when the current contract expired. The report also stated that the current masons' contract would be renegotiated during construction of the project. The Appendix gives the text of the manipulation. No mention of the conflict over prefabricated construction techniques appeared in the contracting specialist's report given to subjects in the *no foreseeable setback* condition.

After reviewing the portfolio and selecting a project, subjects allocated funds to cover the development costs for the first construction period. They then wrote a prospectus explaining their reasons for selecting this project and assigned themselves code names, so that we could return their materials to them at the second experimental session. We felt that anonymity would reduce evaluation anxiety for the subjects, although it could be argued that decisions made in real organizational contexts are seldom anonymous and that eliminating anonymity would have enhanced the realism and strength of the effects.

At the next session, held one week later, we told all subjects that a strike had occurred. We manipulated diffusibility of blame at this time. In the *high diffusibility of blame* condition, subjects simply learned that a strike had occurred. In the *low diffusibility of blame* condition, subjects were told that by selecting their project "they had approved the prefabrication of masonry slabs, off-site, by non-union workers," which "may have violated the union contract." This information reminded subjects in the foreseeable setback condition that by selecting the project they had approved the controversial prefabrication plan that the contracting specialist's report had discussed and cautioned against. We expected all subjects in the foreseeable setback condition to feel responsible for the setback. In addition, we expected those who were also in the high diffusibility of blame condition to shift part or all of the blame for the setback toward the union. For subjects in the unforeseeable setback condition who had received no warning about the use of prefabrication, the information implied that their choice of a project had unexpectedly led to a labor problem. We did not expect subjects in this condition to feel responsible for the setback.

A third manipulation controlled for the possible effects that foreseeability of the setback or diffusibility of blame might have on subjects' perceptions that the strike would continue during the next construction period. We told subjects in the *resolved setback* condition that the labor dispute had been successfully resolved and told those in the *unresolved setback* condition that, although the masons were back on the job, unrest continued and a contract had not yet been signed.

The manipulations for the diffusibility of blame and the persistence of the setback were fully crossed with the manipulation for the setback's foresee-

ability conducted during the first experimental session. The result was a complete 2×2×2 experimental design. Although we tried to ensure that equal numbers were assigned to each experimental treatment, a few people were not able to attend the second experimental session. We eliminated the initial data for those subjects, which resulted in unequal cell sizes.

Measures

Most previous studies of escalation have relied on a single dependent measure, the amount of resources allocated to a course of action. When subjects can calculate the costs to complete a project, as they could in this study, it is difficult to interpret allocations that are neither zero nor the full amount needed (Conlon & Wolf, 1980; Northcraft & Wolf, 1984). Such allocations do not represent complete withdrawal of support, but they are insufficient to complete the project. They can be interpreted in several ways: as a punishment, as an attempt to constrain or control future spending, as a desire to extend a project's completion horizon, or as a mistrust of the cost projections. Similarly, allocations greater than the development costs may represent mistrust of the cost projections, a hedge against the continuation of a setback, a show of support for a project, or a desire to expand or enlarge its scope. Since these interpretations vary in their implications for commitment, we used two additional dependent variables. We allowed allocators to set aside funds for use in the event of future setbacks and measured such funding with a variable called overage. We also asked subjects to indicate the extent of their desire to sell the project, which we measured as a variable called selling priority. Although, like the basic allocations, the additional variables could be interpreted in a variety of ways, each provided an alternative indicator of commitment to the originally chosen project. Results that converged on more than one measure would be more likely to represent commitment effects than would an effect on a single dependent variable.

For the basic allocation measure, subjects made a second allocation of development costs to the project following their review of the project portfolio. They then indicated the amount of resources that should be allocated to the overage account that would be set aside and used in case of further cost increases. Each portfolio also contained a memo stating that there was a potential buyer for the project. The memo instructed subjects to indicate their selling priority on a 4-point scale ranging from 1 = low priority—continue project to 4 = high priority—consider accepting a price covering development costs to date. This scale was reverse-scored for the analysis in order to make it consistent with the allocation measures as an indicator of commitment.

After making the three decisions, subjects completed a questionnaire that contained five manipulation-check items. The first two items evaluated the extent to which they felt that the setback was foreseeable and that they felt responsible for it:

> The setback to the originally chosen project was foreseeable.
> I felt responsible for the setback to the project.

The next two items evaluated the extent to which another party was responsible for the setback or should be blamed for the setback:

> Another party was responsible for the setback to the project.
> The blame for the setback should be given to a third party.

The last item evaluated subjects' expectations that the setback would persist:

> The setback to the initially chosen project will continue.

Subjects responded to these statements on a 6-point scale anchored by strongly disagree = 1 and strongly agree = 6. We mixed the manipulation checks with ten filler items that were not used in the analyses.

RESULTS

Manipulation Checks

Analyses of variance (ANOVAs) were used to evaluate the effects of the three manipulations. Table 1 gives the means of the manipulation checks. The manipulation of the setback's foreseeability produced significant effects on personal responsibility and on perceptions that the setback was foreseeable. The means of both items were greater when subjects were in the foreseeable setback condition. The manipulation of the setback's persistence produced a significant effect on the associated manipulation check. Subjects in the unresolved setback condition were more likely to indicate that the setback would continue. The manipulation of diffusibility of blame produced significant effects on personal responsibility, setback foreseeability, responsibility of another party for the setback, and the extent to which another party should be blamed for the setback. Subjects in the high diffusibility of blame condition felt less personal responsibility, perceived the setback to be less foreseeable, and attributed greater responsibility and greater blame to another party than did those in the low diffusibility of blame condition. Table 1 displays all the significant effects revealed by the ANOVAs.

As in previous studies, the foreseeability of a setback affected subjects' perceptions of personal responsibility, but it did not affect perceptions that another party was responsible for the setback. In contrast, the manipulation for diffusibility of blame both reduced the perception of personal responsibility and increased the perception that another party was responsible. Most important, diffusibility of blame shifted perceived responsibility away from subjects and toward another party.

Dependent Measures

The explicit cost projections subjects received were expected to affect the distribution of the basic allocations. In order to examine that distribution, we categorized the basic allocations subjects made after being informed of the strike as equaling the remaining development costs, exceeding those costs, or falling below the costs. The resulting frequency distribution showed that 62 of the subjects allocated the projected budget requirement to complete the project without further delays, 2 individuals allocated zero dollars, and 3 allocated amounts greater than the projected budget requirement. The

TABLE 1
Means and Main Effect Statistics
on the Manipulation Checks

Manipulation Check Items	Manipulations		Univariate F^a
	Foreseeable Setback	Unforeseeable Setback	
Responsibility of decision maker	3.67	2.78	8.10**
Foreseeability of setback	4.02	3.27	9.17**
	Resolved Setback	Unresolved Setback	
Setback persistence	2.84	3.43	5.18*
	High Diffusibility Setback	Low Diffusibility Setback	
Responsibility of decision maker	2.51	3.60	25.15***
Foreseeability of setback	3.20	4.15	13.20***
Responsibility of another party	4.00	3.40	5.83*
Blame attributed to another party	4.00	2.60	18.07***

$^a df = 1, 59.$
$* p < .05$
$** p < .01$
$*** p < .001$

five allocations of nonbudgeted amounts were not concentrated in any one experimental condition, and the 2 subjects who allocated zero dollars to the development costs also allocated zero dollars to the overage account. Because the variance in allocations to development costs was small and essentially random with respect to the manipulations, we excluded this measure from further analyses.

The correlation between the allocations made to the overage account and subjects' selling priorities was .21. The sign and significance of this correlation supported our expectation that the two measures would converge because both were potential measures of commitment to the project. Given the significant correlation and the unequal cell frequencies, we conducted a MANOVA estimating unique sums of squares to test the hypothesis. Table 2 presents the means and standard deviations for the dependent variables.

The MANOVA produced two significant multivariate effects. The stronger of the two, an interaction between diffusibility of blame and setback foreseeability ($F_{2,58} = 5.21, p < .01$) supported the hypothesis. We did not predict the other significant effect, a main effect for setback persistence ($F_{2,58} = 4.05, p < .05$). We further analyzed these multivariate effects by examining the univariate effects on each dependent variable.

It was hypothesized that the diffusibility of blame would interact with the foreseeability of a setback in the form outlined in Figure 1. Consistent with the hypothesis, significant interactions between the two variables

TABLE 2
Results of MANOVA[a]

(a) Diffusible Blame	Unforeseeable Setback		Foreseeable Setback	
Dependent Variables	Resolved $N = 8$	Unresolved $N = 8$	Resolved $N = 9$	Unresolved $N = 10$
Overage allocation[b]	1.10	1.06	0.57	0.77
	(0.65)	(0.82)	(0.51)	(0.48)
Selling priority	3.25	2.87	2.67	2.50
	(0.71)	(0.35)	(0.71)	(0.53)
(b) Blame Not Diffusible	**Unforeseeable Setback**		**Foreseeable Setback**	
Dependent Variables	Resolved $N = 7$	Unresolved $N = 9$	Resolved $N = 9$	Unresolved $N = 7$
Overage allocation[b]	1.09	1.05	1.11	1.57
	(0.19)	(0.58)	(0.48)	(1.06)
Selling priority	3.00	2.33	3.11	2.86
	(0.63)	(0.50)	(0.06)	(0.69)

[a] Standard deviations are in parentheses.
[b] In millions of dollars.

emerged on both the allocations made to the overage account and selling priorities. Figures 2a and 2b diagram these interactions. The 95 percent confidence intervals of the means indicated that diffusibility of blame affected how much subjects allocated to the overage account when the setback was foreseeable, but it did not indicate allocations when the setback was unforeseeable. Subjects for whom the setback was foreseeable—those with high responsibility—allocated more resources to the overage account following setbacks for which they could not diffuse blame. The interaction on subjects' selling priorities for the project followed a similar pattern, except that the manipulation for diffusibility of blame produced significant differences in both setback foreseeability conditions. When the setback was foreseeable, subjects' desire to sell the project was significantly greater when they could diffuse the blame than when they could not. This pattern was reversed when the setback was not foreseeable. Subjects expressed a significantly greater desire to sell a project following a setback for which blame could not be diffused. Considered together, the results for allocations to the overage account and selling priorities indicate that when an individual is responsible for a setback, the opportunity to diffuse blame promotes a preference for withdrawal, whereas inability to diffuse blame promotes persistence in a project.

The significant multivariate effect of setback persistence was accompanied by a significant univariate effect on subjects' willingness to sell a project ($F_{1,59} = 6.31$, $p < .05$). Selling was a higher priority when the labor contract had not been signed ($\bar{x} = 2.64$) than when the labor dispute had been resolved ($\bar{x} = 3.01$).

FIGURE 2
Diagrams of Obtained Interactions

a. Overage Allocations[a]

b. Selling Priority[c]
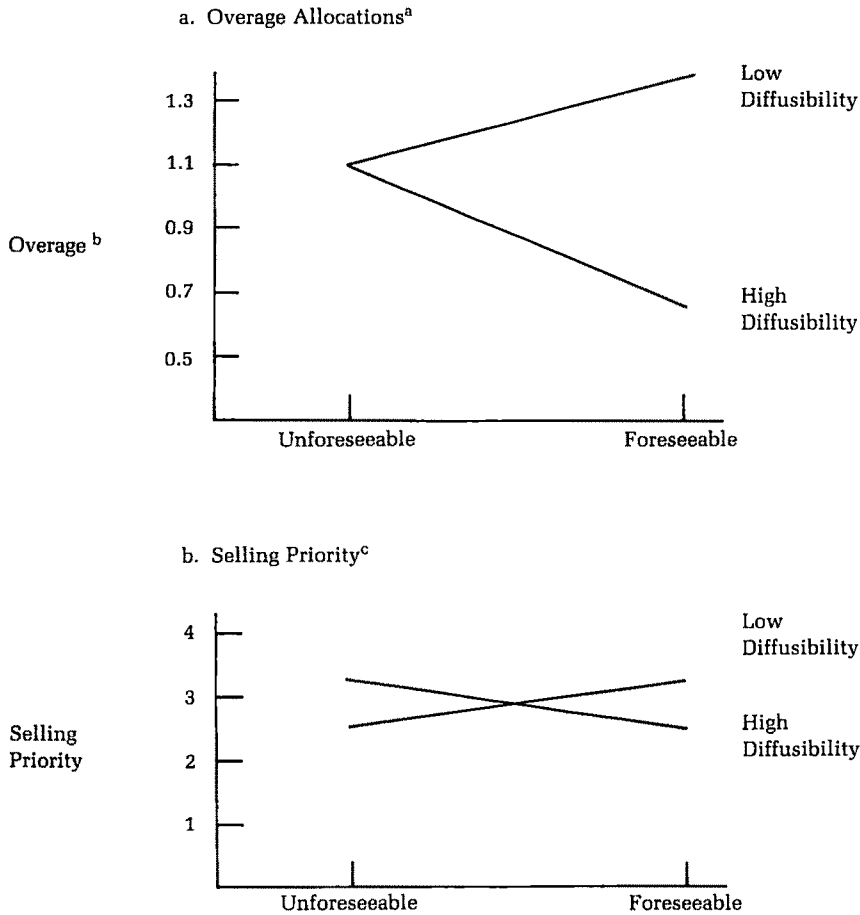
[a] $F_{1,59} = 4.80$, $p < .05$.
[b] Expressed in millions of dollars.
[c] $F_{1,59} = 7.49$, $p < .001$.

DISCUSSION

The results of this study indicate that the behavioral manifestations of commitment to a course of action following a setback depend not only on the extent to which a decision maker feels responsible for the setback, but also on the extent to which another party can be held responsible for it. Although the manipulation for setback foreseeability induced feelings of responsibility in the allocators, it did not explain allocators' differential behaviors for

coping with their responsibility for failure. When they could diffuse blame for the strike to the union's members, withdrawal from the project was a viable option for allocators who felt personally responsible. When the blame for the strike was clearly attributable to an allocator's previous actions, the tendency was to continue involvement in the project.

Alternative Explanations

Several alternative explanations for the results can be ruled out. First, because we explicitly manipulated the setback's persistence, expectations about persistence did not confound the effects of the primary manipulations. It is reasonable to conclude that the hypothesized interaction between the setback's foreseeability and diffusibility of blame was independent of subjects' perceptions of risk or their expectations that the setback would continue. Second, it may be tempting to suggest that, because diffusibility of blame had the effect of lowering personal responsibility, the attenuation of responsibility rather than the ability to diffuse blame accounts for results. In that case, however, diffusibility of blame and the setback's foreseeability should also have interacted to affect perceptions of personal responsibility, but that interaction effect did not emerge. Finally, the results obtained in this study were generally consistent across two different indicators of commitment: resource allocations to an overage account and selling priority. If we had obtained these results for only one of the measures, or if the pattern of results had greatly differed between the two measures of commitment, factors unique to decisions concerning resource allocations or to the sale of a project or other asset may have been the cause. The convergence of the results across both variables strengthens our interpretation that the results reflect commitment.

Implications

One implication of the results concerns the manner in which researchers interpret the allocation of resources following a setback. Although escalation may result from an attempt to rationalize past decisions in the face of failure, the results of this study suggest that the choice of continuation over withdrawal from a project may depend on how an allocator can explain a setback. It remains unclear whether the results of previous studies arose from cognitive biases, such as searching for information that confirms the correctness of a prior choice (Lepper, Ross, & Lau, 1979; Nisbett & Ross, 1980) or from subjects' desire to manage their impression on others.

A second implication concerns the appropriate design of studies of escalation and justification. Investigators have described rationalization as antithetical to economically rational behavior (Bazerman, 1986; Staw, 1981). Consequently, studies of rationalization processes should provide subjects with opportunities for rational choice. Previous studies have not generally defined economically rational pathways for subjects and may be criticized for creating a demand for rationalization or for failing to distinguish between rational and rationalizing options. In this study, the economically rational

signal—net present value—favored continuation. The uniform resource alloca-
tions to development costs indicated that most of the allocators were sensi-
tive to this strong normative information. Viewed in light of that signal, the
apparent desire of allocators in the foreseeable setback condition to withdraw
when they could diffuse blame is a more impressive demonstration of ration-
alizing than it would have been had we not specified the economically
rational path. Further, when rational paths are not specified, subjects may
infer them. Internal validity may be threatened when experimental manipu-
lations affect such inferences.

Finally, the managerial implications of these results are also noteworthy.
Traditional perspectives on control in financial decision making (e.g., Demski,
1980) have emphasized the importance of strict accountability for actions.
Both the need and the ability to obtain accountability by monitoring
employees' actions or by retaining access to the information on which they
base their decisions may be relatively rare. Instead, information asymmetries,
or situations in which it is costly for managers to monitor all aspects of subor-
dinates' behaviors characterize many organizational contexts. Information
asymmetries allow decision makers to diffuse blame by making claims about
the behavior of others, the fallibility of a decision process, or the inadequacy
of the information that was available prior to a decision. Although the ability
to make such claims may reduce undesirable decision biases like nonpro-
ductive escalation, the findings of this study suggest that the ability to diffuse
blame may also lead to the abandonment of projects that are economically
viable.

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APPENDIX

Introduction

This is an exercise in decision making. You will be acting in the role of a vice president for Conwood, Inc., a real estate development corporation. Several decisions need to be made regarding the funding of various real estate projects in the Southeast region—such decisions will be your responsibility in this exercise.

You have recently been provided information describing two office projects located in major metropolitan areas of the Southeast. The following portfolio contains the information on each of the projects. You should examine this information and make a decision to fund one project as a commercial development in your region.

Manipulation for Foreseeability of Setback

The report on union activities indicates some unrest within the masons' union. A lack of resolution regarding the use of prefabricated techniques may create conflict when the current masons' contract expires. This contract will expire during the construction horizon for this project.

Examples of Net-present-value Analysis

Total development costs projected (TDC)	$13,353,500
Annual cash flows predicted for 20 years (CF)	$ 1,745,797
Projected construction time is two years.	

$$NPV = - (\tfrac{1}{2} TDC + \tfrac{1}{2} TDC \text{ discounted 7\% for 1 year}) \quad + \sum_{n=1}^{21} \frac{CF}{1.07^n} - \frac{CF}{1.07}$$

$$NPV = - (6,676,750 + 6,239,957) + 1,745,797\,(10.835) \quad - \frac{1,745,797}{1.07} \quad = \quad 4,367,418.$$

Marya L. Leatherwood is an assistant professor of business administration at the University of Illinois, Urbana-Champaign. She received her Ph.D. degree from the University of Iowa. Her current research interests include the structuring of employment and agency relationships, the effects of sunk costs on decision making, and impression management tactics.

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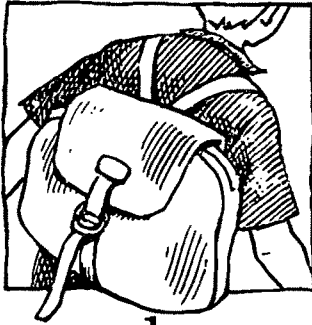**Alonzo J. Strickland**
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